THENATIONAL GEOGRAPHIC MAGAZINE

APRIL, 1947

Steel: Master of Them All With 11 Illustrations

ALBERT W. ATWOOD

Man's Mightiest Ally 23 Natural Color Photographs WILLARD R. CULVER

Finding the Tomb of a Warrior-God

WILLIAM DUNCAN STRONG With 17 Illustrations H Natural Color Photographs CLIFFORD EVANS, JR.

Hong Kong Restored

9 Illustrations

Backwoods Japan During American Occupation

With 25 Illustrations and Map

M. A. HUBERMAN

Operation Crossroads

10 Illustrations in Color

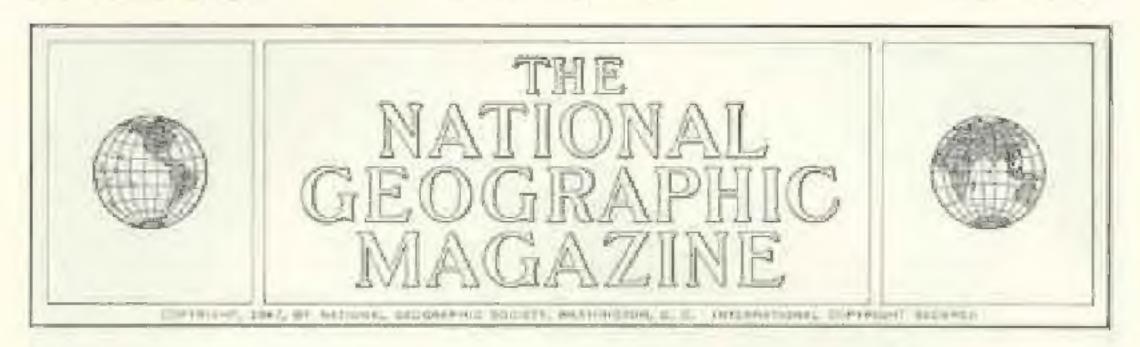
The Flying Telegraph With 26 Illustrations

JOSEPH F. SPEARS

Forty Pages of Illustrations in Color

PUBLISHED BY THE NATIONAL GEOGRAPHIC SOCIETY

WASHINGTON, D.C.



Steel: Master of Them All

BY ALBERT W. ATWOOD

With Illustrations by Staff Photographer Willard R. Culver

N PEACE and war alike, modern civilization rests upon iron and steel. It is the A master substance by which man conquers both Nature and his fellows. As Kipling's verse has it:

"Gold is for the mistress-aliver for the maid-Copper for the craftsman cumuling at his trade." "Good!" cried the Baron, sitting in his hall, "But Iron-Cold Iron-is master of them all."

Today man has learned once again, in the awful tragedy of a global war, that military mastery and world supremacy rest upon steel, the modern form of iron."

Any beach on earth can be taken, at a price, provided trained men are prepared to spend

enough steel.

Nearly two thousand years ago Pliny described it as "the most useful and most fatal

instrument in the hand of man."

While World War II was still under way, Maj. Gen. G. M. Barnes, then chief of Research and Development Service, Ordnance Department, of the U. S. Army, said, "In the final analysis, fire power is steel and still more steel."

But, almost beyond measure, steel makes the products of peace as well as the weapons of war.

Every Tool a "New Hand"

Everything man creates is made by his hand, directed by his brain, or by a tool which is merely an attachable and detachable hand. Each time a man lays down one tool and picks up another he gets a new hand.

As Thomas Carlyle said, "Man is a toolusing animal . . . Without tools he is nothing,

with tools he is all."

Machines in turn are nothing but complex tools, and man's progress can be measured largely by his ability to build such tools.

Once his tools were made of bone or wood or stone. Today tools and machines alike are made overwhelmingly of steel, and with their coming civilization swept forward like a mighty flood.

Steel, of course, is not the only metal of preeminent value to man. But other metals and nutterials cannot be used unless steel comes into play at one or more stages in their mining. transportation, refining, and machining.

But steel is not only the tool of modern civilization; it is also largely the muterial which has built our way of life. It provides the structural basis, the backbone, and, to a vast extent, the actual sinews as well.

When the defense program was getting under way late in 1941, William S. Knudsen said that steel was the "material to start prac-

tically everything going."

It is so common, useful, and essential that we take it for granted. It is so intimately a part of our daily lives that we pass it by unnoticed.

But there is hardly a human need, even for water, food, and clothing, in the supplying of which steel does not play a vital part.

If all the iron and steel in use in this country were divided up equally among the inhabitants. each man, woman, and child would have more than 17,000 pounds.

Each American soldier, sailor, and Marine fought with the aid of about 1,500 more

* See "Metal Sinews of Strongth," by Frederick G. Vorburgh, NATIONAL GEOGRAPHIC MARKETTE, April 1942



What the Housewife Wants to Know: When Do I Get a New Washing Machine?

Washers must compete with automobiles and refrigerators for steel's cold-rolled sheets, which take a fine finish. As the supply is temporarily limited, manufacturers can get only their allocations. Here a Clyde (Ohio) Porcelain Steel worker sprays white enamel on steel tubs. A belt overhead conveys them to fusing overs. The average small American home contains 8,000 pounds of steel and iron (page 418).

pounds of steel in World War II than in World War L.

It is estimated that more than 40 percent of all the factory workers in the country earn their living by making steel into various products.

For all practical purposes, steel is everywhere and is used by everybody. We are rarely more than a few feet away from it.

A Versatilo Motal

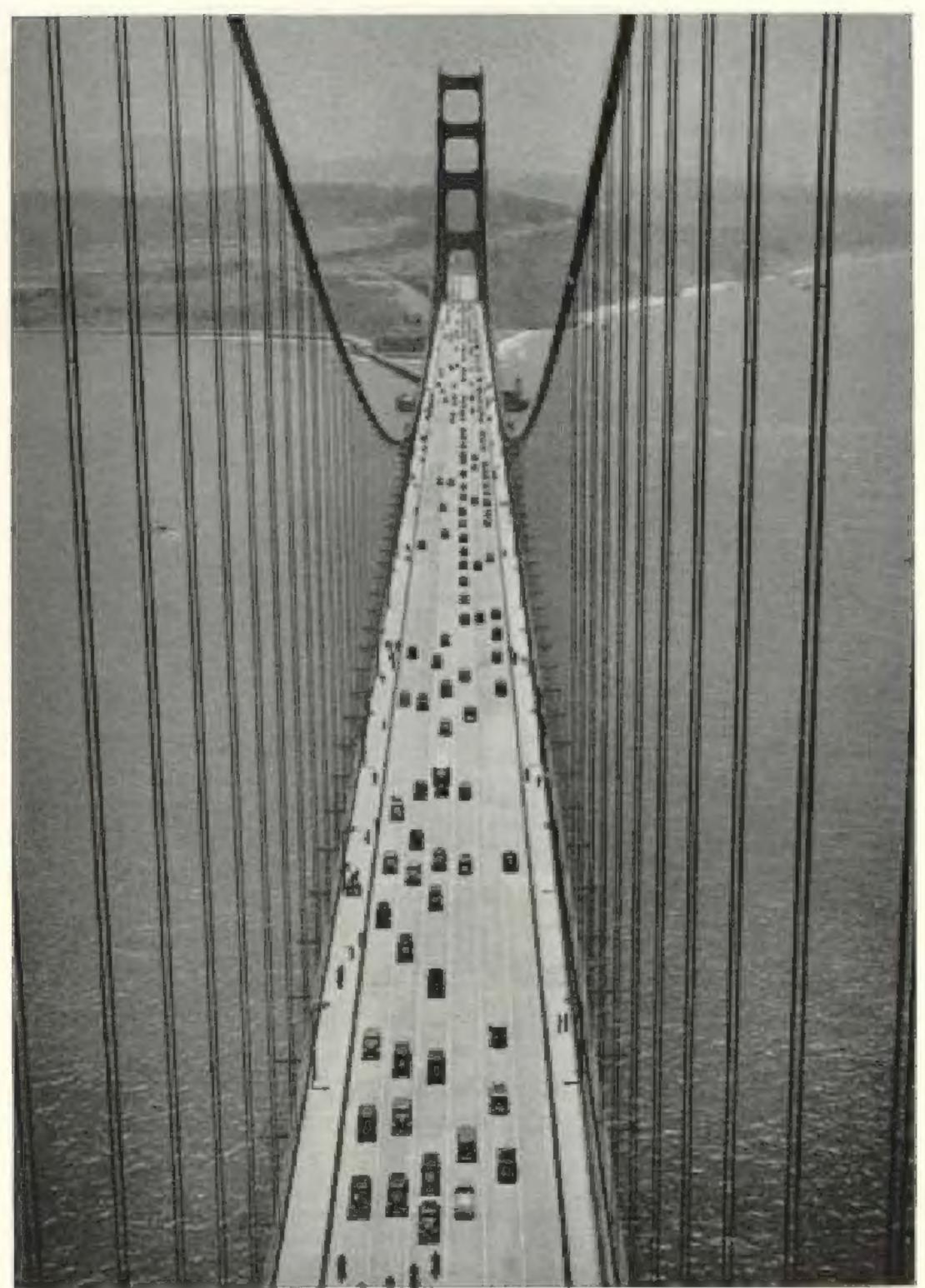
I mail my letters in front of the Norwegian Embassy in Washington, D. C. On the opposite corner is the Romanlike palace of the Apostolic Delegation, and across Massachusetts Avenue are the grounds of the Naval Observatory.

The letter box itself is made of iron or steel; so is the traffic-control box next to it, the lamppost a few feet away, the local street sign on the lamppost, the U.S. route (240) number sign, the maphole covers on sidewalk and pavement, the No Parking signs in front of the embassies, the grillwork and lump fixtures on the front of the buildings, the fence around the Observatory grounds, the gates at the front entrance, and the bus-stop signs on both sides of the avenue.

But these are only trifling and superficial evidences that steel is everywhere. It is in homes, kitchens, farm buildings, garages, offices, stores, hotels, and factories. It is in airplanes, automobiles, rallway trains, street-cars, and ships. It is in the air, on and under the ocean, and on and under the ground.

Steel takes the form of a tiny pin, but San-Francisco's Golden Gate Bridge is also made of it (page 417).

The dome of the Capitol in Washington happens to have an iron cap which weighs 8,909,200 pounds, and in the shoes of the man who walks underneath it there are on the



Gabriel Meeting from Medwood Elegery Association

Steel Leaps San Francisco's Golden Gate in Three Spuns: Only Steel Could Do It

Compare steel's airy cobweb, which carries some 18,000 vehicles a day, with stone's massive arches bearing a trickle of traffic. Into this 9,260-toot bridge (including approaches) went 108,000 tons of steel, enough to load 30 miles of freight cars end to end. Twin towers rise as high as 63-story buildings. Bethlehem Steel built it.



Steel, Sharp, Durable, but Cheap, Serves Our Food

These knives and torks began as blanks cut from metal strips. For smoothness, they were colled, tombled, and buffed. Stamping dies formed tipes and handles. At R. Wallace & Sons, Wallingtord, Connecticut, the naw cutlery is racked for a dip in an electrolytic bath. It will emerge with a coating of nickel.

average 62 pieces of steel, including 38 lasting nails and tacks, 20 eyelets, and sometimes 4 lace tips.

But the home is where we should really look for steel. Even the average small house has 4,000 pounds, and, if iron be included, 8,000 pounds. This does not include the family automobile, which is found in front or in back of almost every house. Automobiles contain 125 different kinds of steel, the average passenger cur requiring 3,400 pounds, or more.

We don't see steel as such in a house. What we see is a furnace, a kitchen range, a sink, a refrigerator, radiators, hot-water heater, washing machines, and bathtubs. Much of it is hidden from view—the nails and screws which hold the house together, and the pipes which carry in water, gas, and electricity and carry off waste (pages 416, 421).

Oil wells, cities, industries, nirplanes, automobiles, and locomotives—all use steel tubing, or pipes, for absolutely essential functions. A steam railroad locomotive has about one mile of boiler tubing (page 432).

Pipe in the Home

But it is in the ordimary home that pipe is peculiarly necessary, for it forms the basis of cleanliness, sanitation, convenience, comfort, and health.

Even the small house has 1,000 feet of from or steel pipe, the larger modern dwelling as much as two miles, and a hig office structure like the Empire State Building as much as 150 miles.

The average family owns far more than a,000 pounds of from and steel. Even the most primitive hillbilly has a knife, an ax, and perhaps a gun. In the average household there are many other tools and implements,

When iron manufacture first got successfully under way in the Colonies in 1644, the metal was cast into pots, kettles, and tools.

Today we spend at least a third of our lives on steel wire, for not only bed mattresses but some pieces of stuffed furniture contain 1,200 springs made from wire (page 452).

From the same material come the ordinary nail, watch springs, piano wire, cost hangers, picture wire, bird cages, bobby pins, hairpins, paper clips, and knitting needles (pages 419 and 434 and Plates IV and VIII).

In fact, one estimate is that 150,000 different uses have been recorded for steel wire. There are almost 500 possible combinations that go into hairpins and bobby pins alone, 2

shapes, 8 thicknesses, 7 widths, and 4 finishes.

One of the smallest steel products, coil springs, are made from wire and weigh only 12 millionths of a pound each. They are used by jewelers in necklace clasps,

All springs are made from wire or bars of one size or another, there being enough steel in a railway-car spring to make 4,000.

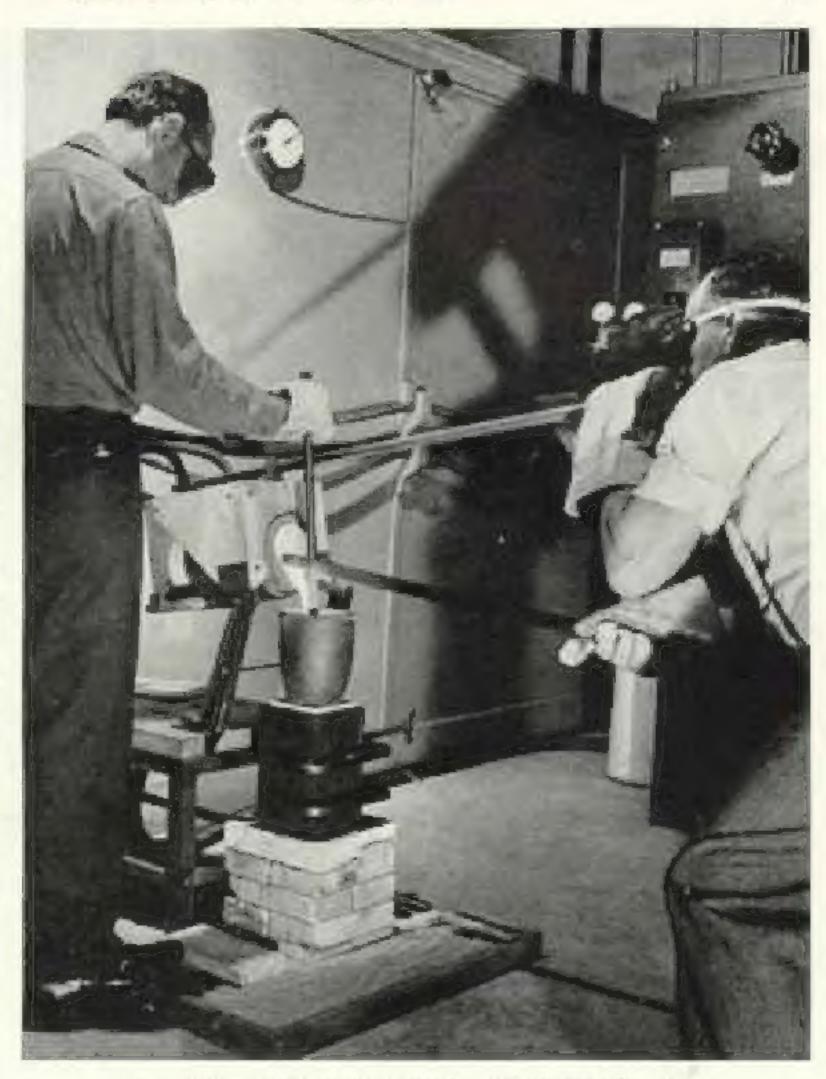
000 necklace and watch-chain clasps.

In colonial days whole families spent evenings and long winter days making a few nalls by hand. Now a single machine in a single plant of a single steel company makes 600 mails a minute.

But the basic principle of drawing wire through successively smaller holes, or dies, is at least 1,000 years old, although of course many refinements and improvements of process and material have been made. It has been said that the "master workman, the spider, has been outdone by man," who by repeated reductions can draw wire until it is five times finer than some

of the hairs on one's head (Plate XIX). Barbed wire has been responsible, as much as anything, for turning our treeless, stoneless western plains into farms and ranches, fencing in stock, protecting crops, and making for variety of production. In fact, a typical 150-acre grain and dairy farm has up to 40,000 pounds of iron and steel, in addition to that in the dwelling and farm buildings.

Besides the barbed-wire fence and poultry netting, there are milk pails, cans, and strainers, and, to the city dweller, a bewildering variety of tools and so-called farm machinery, all the way from a sickle, prototypes of which were made several thousand years before



Men Pour the Molten Brains of 20,000 Watches

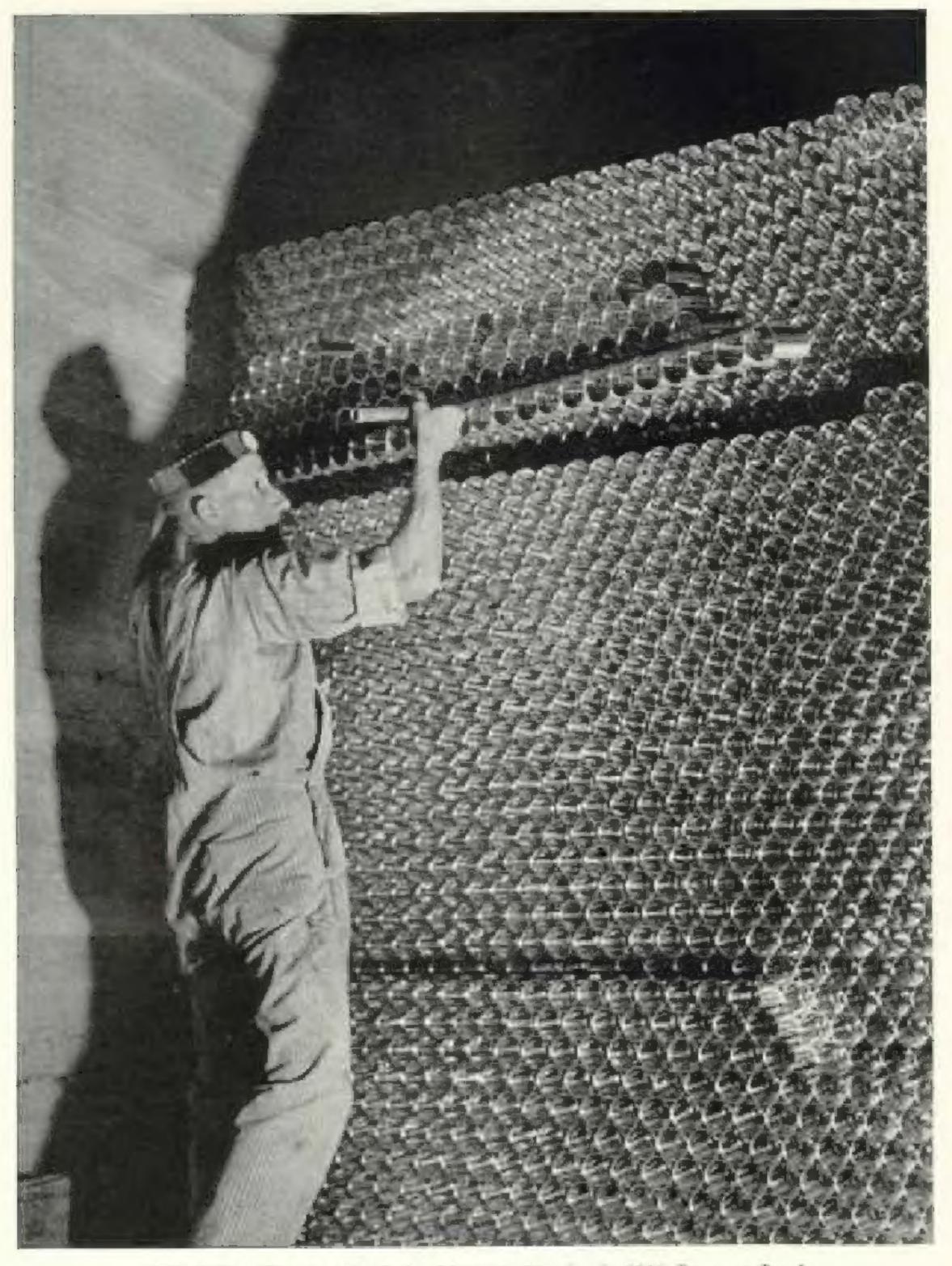
In a ministure mill at Lauenster, Pennsylvania, Hamilton Watch Company metallurgists mold 75% pounds of nickel steel. From the ingot other men will draw 20,000 dainty hairsprings, which regulate the balance wheels of watches. If valued at SL75 a spring, the steel ingot is worth \$35,000, or nine times its weight in gold (Plates IV and VIII).

Christ, to the most complicated modern combine.

Much of the food grown on farms reaches the housewife in "tin" cans, which are not made of tin at all but of sheets of steel, with a tin coating to prevent rust and other kinds of corresion. This coating today is only about 1% percent of the total weight of the can (Plate VI and page 420).

20 Billions of Tip Cans

No one knows how many tin cans are made cach year in this country, but a reliable estimate is 20 billions. A typical the can costs about two cents.



"Tin" Can, Preserver of the Nation's Foods, Is 981/2 Percent Steel

Only the rust resisting surface is tin. An economical new electroplating process has replaced in part the old not dip (page 419). Cans have been scarce, owing to metal shortages. In many instances, glass, fibers, and plastics have substituted. With a rakelike bar, this California cannery worker moves dozens of empty tins.



Stainless-steel Cooking Vessels Withstand Attack by Fluids and Flames

Barely 35 years old, stainless steel has grown to an annual production of more than 300,000 lons. Cooking vessels alone take about 14,000 tons. For diffusion of heat over the fiame, these pots have copper bottoms. At Rome, New York, a press (left) stamps the trademark of Revere Copper and Brass, Inc.

Japanese capture of the Malay tin mines early in the war forced a rapid development of the electrolytic process of coating steel sheets with tin, since in this way 60 percent or more of the valuable tin is saved, as compared with the old hot-dip method.* An electric current evenly distributes particles from 90-pound anodes of pure tin on a strip of steel moving forward continuously at the rate of 1,000 feet a minute.

Enormous Wartime Production Dramatized Steel

World War II dramatized steel and drave home the fact that it is everywhere and that it is used by everybody.

During the war this country produced twice as much as the three Axis powers combined. In 1940 and 1941 we increased our capacity by an amount almost equal to Japan's entire production in 1940.

The armed forces had to have steel for

barrack units, portable bridges and landing fields, docks, helmets, bayonets, trucks, jeeps, tanks, LSTs, bombs, shells, guns, and ships.

A battleship such as the Missouri calls for as many tons of steel ingots and castings as some 71,000 automobiles, and just the alloy-steel transmission of a medium tank weighs as much as three automobiles.

Although aluminum and other metals figure largely in airplane construction, alloy steel plays vital roles.

A number of new steel alloys were developed during the war for use in gas-turbine engines for aircraft. Some can withstand great extremes of beat and cold, ranging from temperatures of approximately 1,200° F. down to an arcsic 65° below zero at 35,000 feet.

Jet propulsion presented new problems, because of the high temperatures at which the

* See "Fin. the Conderella Metal," by Alicia O'Reardon Overbeck. Narrosan Guideavine Magazine, November, 1940. engines operate. But research on steel alloys and nonsteel alloys made it possible to go approximately 500 degrees higher than had been

possible in the past (page 451).

A four-engine bomber has 1,000 steel springs in its fuselage, engines, and armament, the nose guns being almost literally chains of steel springs. In fact, almost no weapon, from matamoth projectile to small pistol, can operate without springs, which do not generate energy but control it by absorbing, storing, and releasing it.

All over the world our Army and Navy planes landed on mats which were made of

steel sections.

Tens of thousands of steel huts became the inevitable landmark wherever American fighting men were quartered. They were flown to places inaccessible by rail or ship.

One of the largest orders for steel ever placed with a single company was for tubing for the 1,340-mile-long wartime "Big Inch."

Fortunately, our country had a large reserve steel capacity when war came. Moreover, steel-mill products are much the same whether the final use is for war or peace. But even with these advantages the industry's capacity was nothing like enough for the rapacious appetite of war, and to increase it meant overcoming a peculiar, an extraordimary difficulty.

Increasing Steel Mills' Capacity

The difficulty was that new steel mills themselves require enormous amounts of steel. Early in 1941 it was estimated that to increase steel capacity 10,000,000 tons in the following two or three years would "abstract" from the supply of steel more than 4,000,000 tons.

In other words, the tools and buildings to make the steel to make the weapons of war

had to be made of steel themselves.

This problem was solved, as Secretary of the Navy James V. Forrestal expressed it, "by the resourcefulness and adaptability of American industry and the will of a free

people."

"scrambled" rather than by the "grass root" method; that is, instead of building entirely new plants from the ground up, increased steel capacity was obtained mainly by adding to, rounding out, and balancing existing plants. This saved both time and critical materials, 10,000,000 ingot tons' capacity being added at the cost of only \$00,000 tons of steel instead of more than 4,000,000.

This method had the advantage of using existing experienced management and all the

collateral service facilities, such as water, steam, gas, and electricity in a going plant.

Some secondition equipment was moved from place to place to round out productive capacity. In one instance, a whole abandoned plate mill was moved from Youngstown, Ohio, to Houston, Texas. Except for the electric transformers, an entire alloy steel plant was built of used materials, assembled from different places.

The largest single war need for steel was for plate—plate for the two-ocean Navy, merchant marine, tanks, heavy trucks, locomotives, machinery, and endless other war uses.

Since there was no time or materials to build additional plate mills, more than 5,000,000 additional tons of plate had to be made each year in the continuous-strip mills, which had been built at an average cost of \$15,000,000 to \$30,000,000 each to roll out light, ribboolike sheets for automobile bodies, refrigerators, and tin cans.

Sheet and strip steel is thin, and the mills were equipped to coil up 1,000-foot lengths on hig spindles as they came off the rollers. But plates for shipbuilding are too thick to be

coiled; they have to lie flat.

In no way stumped, the steel industry fastened to the ends of continuous-strip mills the frames of old, unused buildings to provide more space in which to lay the plates flat. Heavier shears to cut it, and heavier tranes, conveyor tables, cooling beds, and handling equipment were added.

More than 3,000 separate projects to enlarge steel capacity in the interest of national

defense and war were undertaken.

They ranged in cost from a few thousand dellars to many millions. An addition to the famous Homestead, Pennsylvania, works required the removal of 1,500 buildings and 2,700 families.

But mechanical ingenuity, typical as it is of our American way of life, does not explain

the miracle, the wonder of steel.

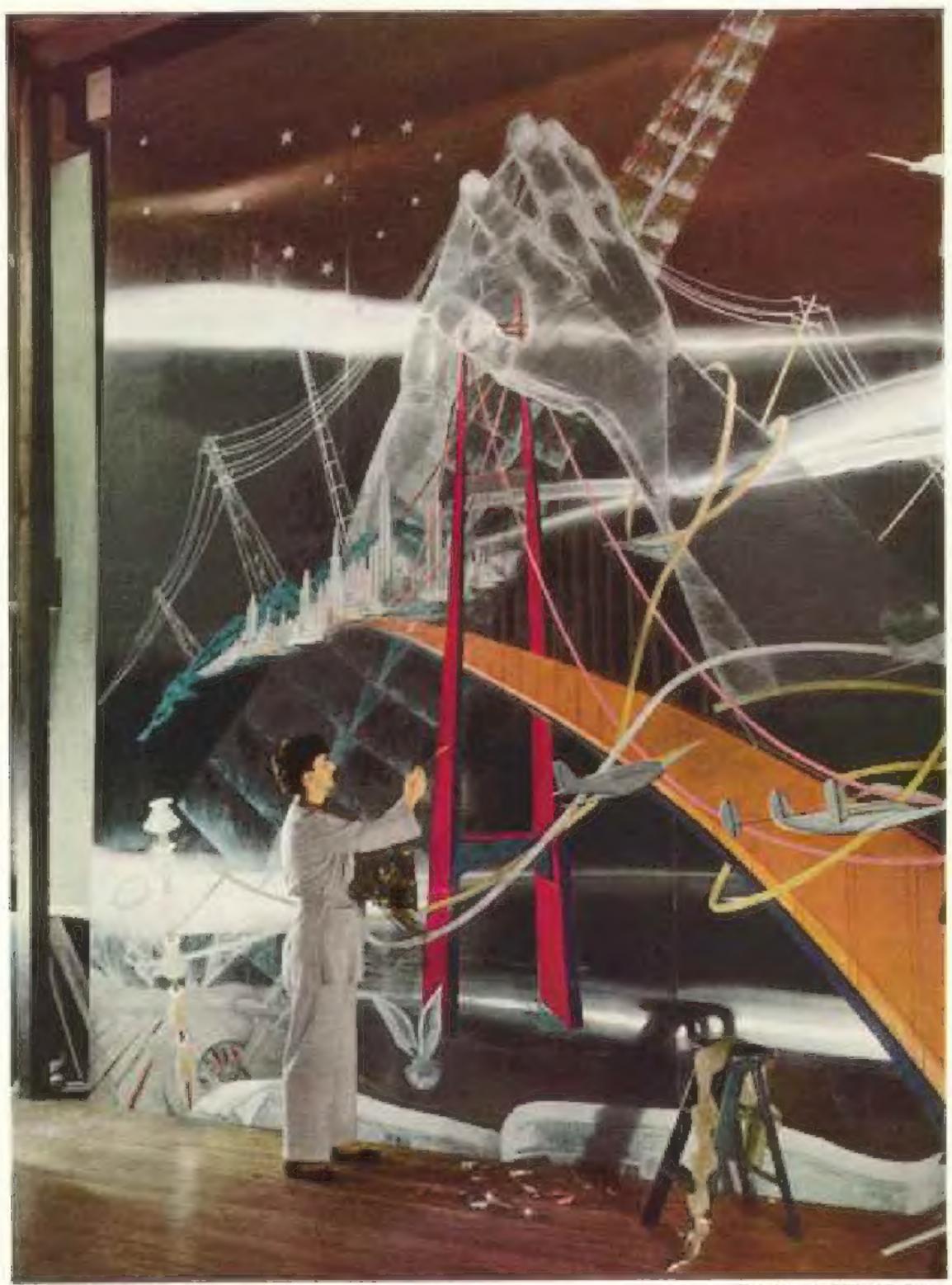
Why is steel found practically everywhere? How can it be produced in such produces quantities? Why is it the raw material for "fabrication," or conversion into an almost infinite variety of durable goods?

The answer is that steel is not a single commodity but a wide variety of distinct materials and commodities, collectively known

as "steel."

There is no concise, satisfactory, or comprehensive definition of steel. The word is merely a general term; the name is not used to denote a definite product. It is a class name, not a specific one.

Before 1938, until work on the atomic bomb



D National Governgbile Society

Kadachtone by Willand R. Cutter

Using Stainless Steel for a Canvas, an Artist Paints the World's Communications Story

In her New York studio Miss Buell Mullen completes a mural for Brazil's Ministry of Communications. The giant hands represent the touch of fingertips, man's first message. A beam from heaven conveys spiritual understanding. The press (lower left) spocaris intelligence. Eighteen fact high, the polished sheet weight 1,400 pounds.



the Open Kong with Porge no. - St. I was Leverte the Spreading Chapters True and Taker to · Best hours 4





Her Handiul of C bush Steel Will Make Hautsprings for +5 ll W value

At left to an Institute of eigenstrate production of all state that the state of th



Interchangeable Parts Teach the Young Lacencer to Build (In Days Seed Coupute





both the Male Charles into Estille Realisans

both to the tenth of tenth of the tenth of tenth of the tenth of the tenth of the tenth of tenth of tenth of tenth of tenth of tenth of tenth

Section Dentes Checks a Saw's to take insti-



Fitty-two Sirch Rodlers

the North to graphs Microsoft



Rugged Car Spring and Deliette Watel Springs Challer and Trace with Steel by the Carlo of the Ca



Steel Split as I bring for a Draz boar fighteen when a

declosed several new additions, there were 92 recorded chemical elements that constituted the known physical matter of the universe. Of these no fewer than 20 are used in various proportions and combinations to make steel.

The stort industry is no assembly-line proposition where parts are put together into a finished product, as in an autom dile plant. Rather, it creates from the very clements of the physical universe canterial that did not exist before.

There are two indispensable steps in steelmaking. First, iron ere is turned into Iron;

second, from is turned into steel.

Earth's Surface Abounds in Iron

Fortgrately, one-twentieth of the earth's surface consists of item, and workable deposits

of from one are found in many places.

By for the lathest part used in this country comes from the Lake Superior district, where it is found mainly in six long, narrow ranges. Chief of these is the Mesabi, 90 miles long and 2 to 10 miles wide, the word "Mesabi" being Chippens Indian for "giant."

The appearshality of this ore is one of the chief reasons for the extensive use of steel

in America, particularly in wartime.

Being close to the surface, most of the Mesabl ore is due from open pits by power shovels and removed by trucks or trains of cars. As many as 15 persees are due into the sides of a pit so that shovels, trucks, and trains can operate. Some ore is mined underground (Hates IX, X, and page 437)

Specialized railroad equipment carries the ore downgrade the short distance to Lake Superior, where it is transported in huge ore limits to the lower parts on Lakes Michigan and Erie, from Chicago on the west

to Buth lo on the east (Flate XIV).

These are bosts make a practically contioners shuttle or encless chain of suyages during the envigation season from about May I to December I, each bost covering some 40,000 pages during the period and staying in port only a few names.

During the five winter months ice and strens make shipping hazardous. In addition, the are freezes like concrete and will not flow from the "happer bottom" tailroad cars into the packets of the building docks and thence into the builds of the ships

Lake Superior ore proved to be a gigantic stock pile for war purposes. This was because one ton of ore is normally "neveroped" for each ton mined. This means that the over burden is removed and the ore got ready for miring, even though it is not taken out.

Thus production can be stepped up very

quickly, or slowed down, with low maintenance costs and latte adverse effect. In the single year 1942 more than 92,000,000 tons came down the Lakes from 1°, S, and Ca action ports, or nearly eight and a half times what Germany produced in prewar years.

from exists in the sun, stars, hearly all hard rocks, the sea, museral waters, plants, animals, and in practically all soils. But, unlike some other common metals, it is not found in Nature in a free, or metallic, state except in meteorites which have fallen from the sky and in some unusual layers in Greenland.

The are from Messbi and many other places is really a form of rust, saft, rich, powdery, and community brick red in color. By putting it through the blast furnace, this rustlake rusterial is restored, or smelled back into metallic form.

To turn out from blast furnaces must be fed huge quantities of coke and limestone,

as well as ore."

Ordinarily, more than a fifth of all railress, freight consists of materials going to and from

steel mills.

In 1943 the militaries newed to steel plants shout six and a quarter million rationes of such materials as ore, coal, limestone, strap or may no se, chromite, and other special ores. Two million cars were provided to had the finished steel away.

Thus the cost of handling and transporting raw materials is of major importance to the

steel ladustry.

Naturally, most blast furnities and steel mills are located where the costs of assembling these materials and of shipping finished products to large markets are economical.

They are usually located on the shores of lists or rivers, not only because of theap transportation but because the industry itself, when working at capacity, uses four to five tones daily as much water as all five beroughs of New York City, or more than 3,000,000 gallons a minute

A sincle plant, that of the Bethlehem Steel Company, at Spatrows Paint, Baltimore, averages daily more water than the city of Baltimore. The Lackawanna plant of the same company at Buildo uses daily more water than the city of Buffalo.

As a rule, are moves to coad rather than the other way around. Coal is bulkier and deteriorates more rapidly. Extra manifing breaks the lumps of coke and makes them unstituble from the viewpoint of size.

As a result of these and other autural forces.

*See "Cont. Produces Worker for M. n." by Albert W. Atwood. National Gracianing Malazine.

May, 1644



Twesty meh Gons Built to Ship Waser Or, or Gas I for a Watershelon Salva

steel production is highly concentrated in such places as Phisburgh, Pennsylvania: Gary, Indiana; South Chicago, Illinois; the Lake Erle ports; the valleys between Lake Ede and Pattel urgh; Microingham, Alabama; and eastesta Penusylvania and Maryland, with such steel centers as Bethlehem and Sparrows Point.

Appalachian Coal Meets Chile's Orc.

At Sparrows Point coal from the Appalathings meets cheaply water-borne are from (Tribe

Despite the wartime exection of steel plants in Utah and California, the greatest torrage Increase in production was in the Ellisburgh district aself, which includes a number of industrial satellites in the surrounding areas of Pennsylvania, Ohio, and West Virginia. Pittsburgh is still far and away the outstanding symbol of the Steel Age.

I Stood outside the giant blast farnace No. 2 at the Eduar Thomson Works of the Carnegie-Hainois Steel Corporation at Braddock, Penns Sylvania, kokung at miniature near-by mounlains of ore stored against the coming winter.

Not far beyond these stock piles were the hills where General Braddock and his army, including the youthful George Washington, were so disastrously defeated by the French and Indians in 1755. The ground where we stood had felt the trend of Braddock's troops as they murched from the Monoagahela River to the ill-fated buttlefield

follay the main line of the Bakimore & Ohin Railroad runs directly through the Edgar Thomson Works, and the Pennsylvania skirts along the edge.

Not long before my visit, No. 2 had hung up a world's record for turning out 1,975 tous of fron in a single ony.

Here at a torre in various parts of the country are the rains of more than 1 000 early Idast farnaces. How much smaller they were than the se of today is shown by the fact that fewer than a thurt of this number were enough to supply the entire country with iron due ug World War II.

A moviern blast furmore is a buge brick-lined steel stove, about the bright of a 10-story building Into it ore, coke, and limestone are "charged," or dumped, in proportions of 12, to and 3; that is, 2 turns of ore, 1 of coke, and 13 of Innestone (Plates XII and XIII).

A blast furbace is practically in continuous specation, running for months or even years; it stopes only when regalis become necessary.

Formadic blasts of air, heated to 1,000° F., are his was into the farmace to promote the smelting process. At least four tons of air blast are needed for each ton of iron produced.

Coke and limestone release the Iron from its chemical prison. Without coke it would be necessary to use chatmal, as men did for many centuries, and without limestone is might be necessary to use oystershells, as the New England colonists did.

In early times bouland was threatened with denudation of her forests to obtain enough chargoal to make the limited amount of iron required in those days. To get eneugh that coul to make the iron and steel needed now is

urthickable.

Litoestone converts the nonnetalic materials in the ore into slug, or cin ler, which rises to the top of the motal bath and is released every few hours from the higher of two tapping holes, while the molten from pours out of the lower bole.

I not ced that a 1,000-watt floodlight in the wall paled into after insignificance as the molten from and slag, in all their fiery splendor, came rearing from the lurnace,

Although slag has many uses, such as milroad bullast, cement ingredient, and highway and rooting material, so much is produced that only a small paint of it can be utilized.

A modern Flast lumage is a very costly, methanized, largely automatic chemist's shop, nighty efficient, and gigantic beyond the layman's infini to grasp, a gargantuan linek Rogers' dream.

In the bowels of the earth far below the furnace itself I watched materials continuously come and go, with no workmen in sight,

While I turned my head for a few seconds an automatic train had come, almost silently, damped 7,500 pourds of material within a few feet of the, and had gone without my even seeing it.

True, on one train that aid frust sat it workman, and reassuringly on the seat beside him was a newspuper opened to the sports 125,00

How Pig Iron Got Its Name

The from which comes form the blast furnace is known as pla from because in earlier days it was east in sand molds, from a punin ridiway to smaller rithways or depressions on one or both sides, and these runways had a functed resemblance to a sow with a litter of suckling pigs,

levention of a costleg machine changed all this. In any case, most of the metal is no longer cast and cooled into pigs, but goes on in a continuous process in molten condition until it ends up as steel rails structural shapes, bars, tubes, and sheets.

Although steel can no more be made with-



Vibrant Steel, Strang in Harps, Huns Monealy

Ence the late with the control That the first the first term of the control terms of the cont

at not than bread can be made with it is the last furnation with the expension of the group of good through the group of t

the district control of progress of the terminal strains of the second section of the second second

The state of the s

In a 1 / string of the sure of

High temperature

Are a sential to bed
Radic; the sense of

Arethodox of the present

That he gas a set will

I the continue of

A touch he so it has a money seet of a seet of the see

a steel plant to cast \$100,000,000 Map chines to be seen that he can be seen to be seen to be seen to be seen by the transfer to

From Iron Age to Steel Age

I was of sentent to me specificate as a sentent to the control of the control of

An Armena, Walter Let discounted

the same method of making steel at practhally the same time, when he tried to produce malleable from by blowing air through a bath of malten blast formure from.

Kelly's Camily thought him justine and forced him to go to the local doctor, who fortunately was so well educated in science that he realized that the oxygen in the aleway is itself all the fact that was needed.

Steel had been made in small quintities and by laborious processes for many centuries, for use as cutlary, edged tools, and weapons, such as the swords and daggers of ancient Japan, India, Damascus, and Tolede, and for madieval armor.

But the Bessemer converter, coming at the same time that coal and coke replaced character as an industrial fuel, first made steel available in the commercial quantities needed in modern late.

The Besserner process, together with the even more productive open-hearth process, which came after the Civil War, ended the Iron Age and ushered in the Steel Age, thus making possible the internal development of America.

A Bessemer converter is a pear-shaped, tilting vessel, holding from 15 to 35 tons of molten pig aron, into which 20 000 cubic feet of air are blown per minute. It takes only 15 to 20 minutes to make Bessemer sizel, whereas the open-hearth farnace, although holding a much larger thurge, takes 10 to 12 hours.

A Besseuer converter puts on one of the greatest shows on earth. It is sometimes talled the "flame thrower of the steel front."

Milbons of railroad passengers on roate a Platslungh, Cleveland, Detroit, and Chicago have been thicked, especially at night, by the colors of a Bessever is action. The lames reach high in the heavens and range from raddy red through lamin orange and pale yellow to blinding white (Plates XV and XVIII)

As the l'ittshurgh district nulls are nearly all on river banks, the scene at night is doubled by reflection in the dark waters.

Open-hearth furnaces normally produce to see than 90 recent of all seed made in the United States. They are large brick rooms with busin-shaped floors; the name "open hearth" comes from the fact that the floor's exposed to the awers of the flower.

The open-hearth furnace has come to have a permitted significance and value in our modern economy because it uses about 50 percent or even more of scrap—that is, of ased steel. Thus it saves an enormous quantity of ore, as well as fact and linestone, which

would otherwise be used to make pig from.

In this way steel can serve man indefinitely and can be used over and over again. It is lost only by rust, to a slight extent by alreasion, or such tubbing away as takes place, and by being lost at sea.

It is not yet determined whether ships lost at sea in Werll War II and steel grap left, on the patthcheld can be economically salvaged, but the amount of course is considerable. No doubt many surplus ships will be broken up for scrap. The all-futed Annount is estimated to compain about 53,000 tons of usable steel scrap.

Unfortunately, for some time before the war we sold a consideral le proportion of our strap to Japan. In the five or six years before l'earl Harbor we sent that country noise than 7,000,000 tons.

The Uses of Scrap

Steel ralls buy in ge quantities of scrap, sometimes 50,000 carbonis a propth, or more. One Onio mili bought 50 carbonis of unused military kinding mats a few months after V-J Day (Plate XI and page 451)

But half or more of the scrap used is produced by the mills themselves. This is possible because, in the course of producing steel products, there are constant discards from transing or cropping, but ug, etc.

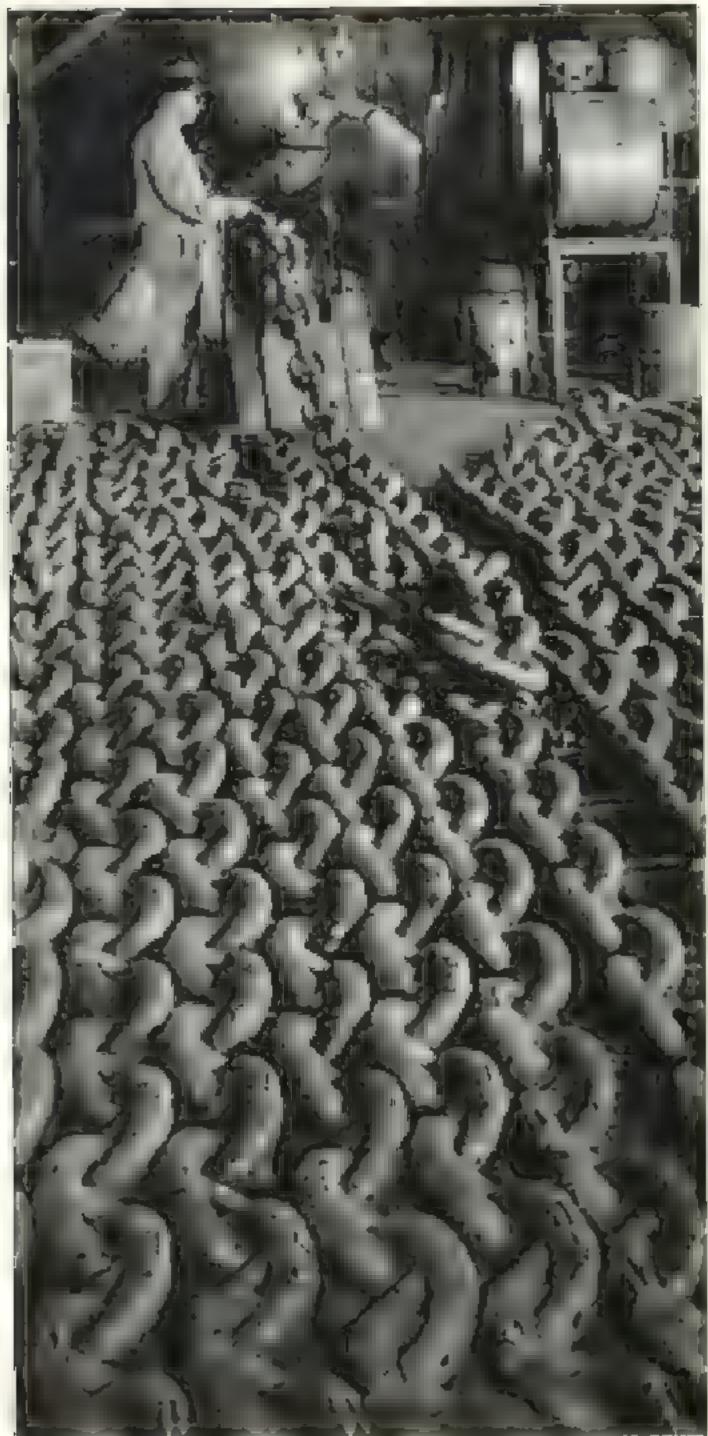
A good illustration is the cylinder of a military airplane engine, which is only 10 percent as large as the original black of steel from which it is made.

This kind of scrap is known as "home" of "con-aromic" serip, and naturally it is in continuous circulation.

The eyen-hearth furnace is charged with multim pig iron, scrap, fermalleys containing manuscree, limestone, and various mocalled alloys, as required. Only the alloys are put in by hand spage 4511.

Practically the only fond which the electric fornace consumes is scrap, although some molten iron may be used. On the other hand, steel may be "di plexed" by being put through the open hearth after it has been made in the Bessemer, or even "triplexed" through all three formaces,

In the electric and furnace, large sticks of curbon, called electrodes, extend down through the roof to within a few in thes of the metal bith, with a critic axis to furnish the heat. High tem seratures are reached very rapidly in this way and are subject to exact control. Although the process is more expensive than the Be-senier and open hearth, and production much smaller than either, some of the finess-grade steels are frequently made in the electric



ha A to water

Anchor Cha e I lows from Machines Like Sousage Lords

A Secretary of the selection of the median of the selection of the selecti

correct examinate light alloys

from a line three types

from a line type y a med to

constrain to 1 in Approx y a med to

in a real absentation to the first

the line NA line was made to as

if a line is against to the first

which are the first to the

Inget Is Measure of Technetian

All posters of steel chine to recipie the medical the medical transfer of the first tran

property of a modern meet as property of the management of the management of the property of the management of the manag

The transfer of the states and the transfer of the states of the states

Strippe of its old, sar 45

or opinis since by apid

stellis less sepred at table

please of its at a 1 office

to de kor for other a pid

chartest sepre

Somether the property of the XXX has been a surfaced by the property was all the property with the property was all the property of the proper

the first one emergence of the NATA



To Make New Tools for Mr. a Steel Monster Golgs Six Cabe Yands of five Ore

Ender the second of the second the second of the second of

These in turn go through further miling, and finally we have the "finished" products—tails, tubes, plates or sheets, bars, and structural shales.

It is a fascinating sight to stand by the toller, who controls the operation from his platform, or 'pulpit,' and watch an ing to thoom, or stab, but be steadily and sedately along toward its destiny. Somehow, steel seems to be ranking itself.

But of course it does not make itself. For a product which is so common and which costs about 3 cents a pound for the ordinary grades, on amazing amount of care

is taken in its production.

Samples are tested constantly, all the way from the carloads of ore leaving the Mesabi to the finished product. Some 37 analyses are made of an 180-ton open-hearth "leat." During a few minutes in which I watched on open-hearth furnace, several samples were taken out and sent to the laboratory.

One company alone has more than 170 different laboratory organizations. Another company has 1,500 metallurgists, chemists, and laboratory assistants, not only in its labora-

tories but in its mines and mals.

Yet much discretion must be left to the workmen then server. Steelmaking is highly mechanized, but since many of the operations are not routine or repetitive, they require decision and judgment on the job.

The Muman Tough in Steelmaking

Steelmaking is an art as well as a science. Despite all the assistance which the technical men can give, despite all the chemistry and physics at their disposal, only the melter or assistant melter in charge of the furnace can decide whether the time has come to tap or not to tap. He must look at the fiery mass, through his colored glasses, and be must draw out a sample to see if it has become strel, just as the housewife must draw out a lattle quantity of enoculate sympto see if it has become frage

The steel industry is nearly devoid of trade secrets. Small technical improvements are made by in livids at melters or other men in the mills, and for a time these may prove

to be of benefit.

But major developments, such as the electrolytic tin-plating process, are usually patentable and are licensed to other companies. As soon as something new comes along, competing companies either take out a brease or develop a sanitar process or product, possibly by a different route. It is a common saving among the metallorsists that as soon as a sample can be had, one company has a lead

of only six works over its competitors, in the complicated industrial world of today steel must be made to do a particular int.

The aut mobile, airplane, petroleum, electrical, and chemical industries, to mame only a -w decrease. It is the befor special purposes. This can be done betause steel is not a single thing; it is almost anything, and it can be given almost any

mechanical property.

A single practical Testration is the fact that the meximum depth of many producing oil wells has been increased from 3 000 to more than 13,500 feet by providing steel adapted to oil-well drill pipe. In a few other instances, test wells have been drilled to more than 15,000 feet.

A more bigure identication is the fact that a 14-inch steel plate can be pierced by a spike made from the same plate, if the spike

is properly heat-treated.

True, we usually think of steel as steam Comparing it with other materials we say. "This is stronger or weaker, harder or suffer than steel." Chancer and Shakespeare used the phrase as "true as steel," and Multon said that a woman who has chastily "is riad in complete steel." The word itself apparently comes from the Teutonic stabul or stay, meaning "firm" or "rigid."

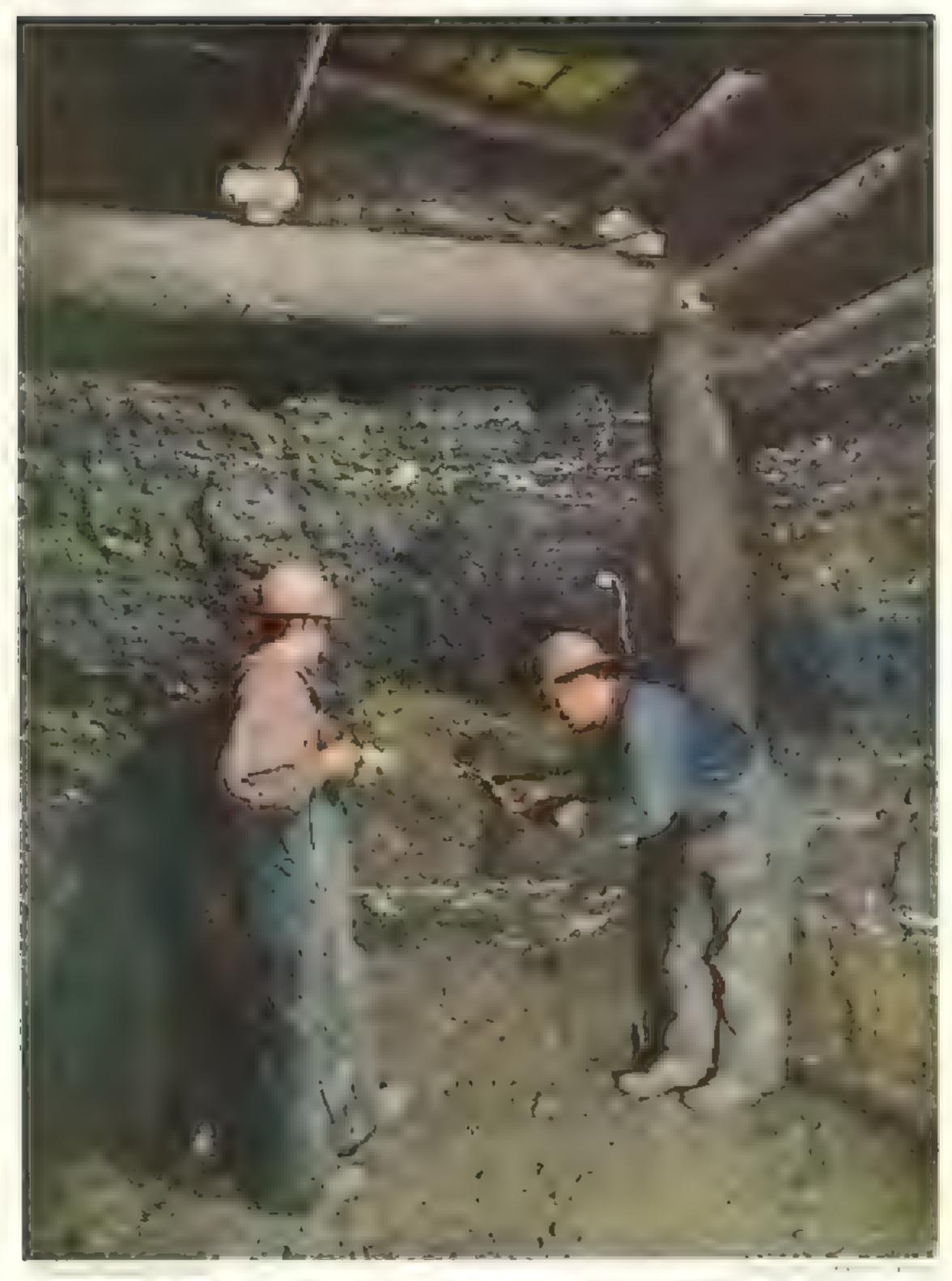
But sensible men do not use stronger materials than are newled for their purpose. It is an intredibly foolish waste to use the same kind of steel in an awaing fixture or horn-door hinge that is used in an airplane cague

The steel that goes into a soldier's helmet must have enough give not to crack when stamped out. But it must be hard and tough enough to resist bullets and shell fragments.

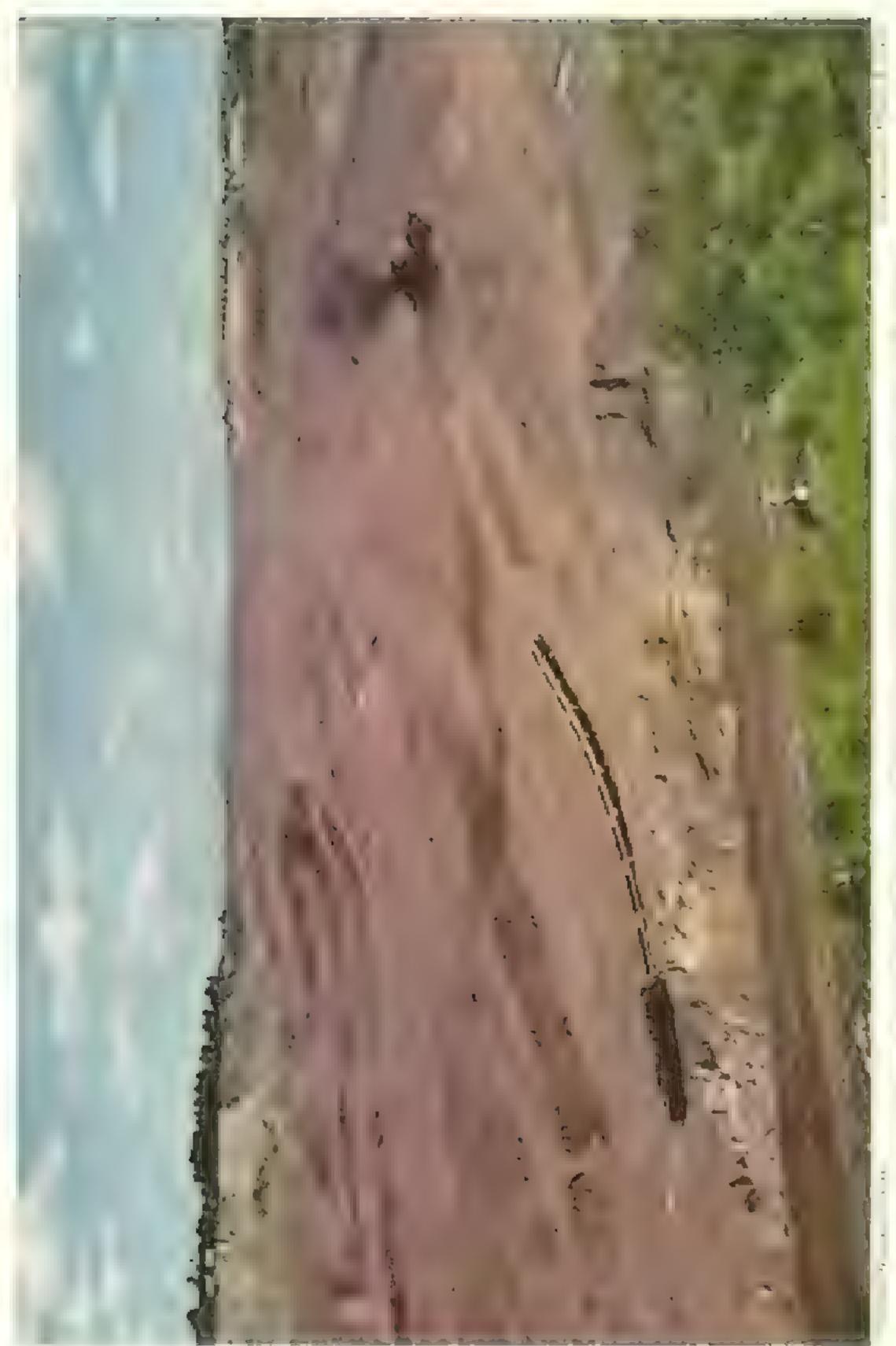
A block-tweeter bonds requires glasslike bardness on the inside. A plowshare should be aft maside to prevent breakage and hand outside to prevent abrasion. Ruger blodes must be strong, but they can be made cheaper if brittle, because it is easier to grind and hone brittle steel.

Exhaust valves must not warp or burn A bridge must withstand stresses and strains An oil-well drill that goes through thousands of feet of earth and took must keep its keen cutting edge. An airplane crankshaft must have strength, plus ability to withstand vilorations. An automobile fen let requires ductably and smooth finish; above all, it must brad

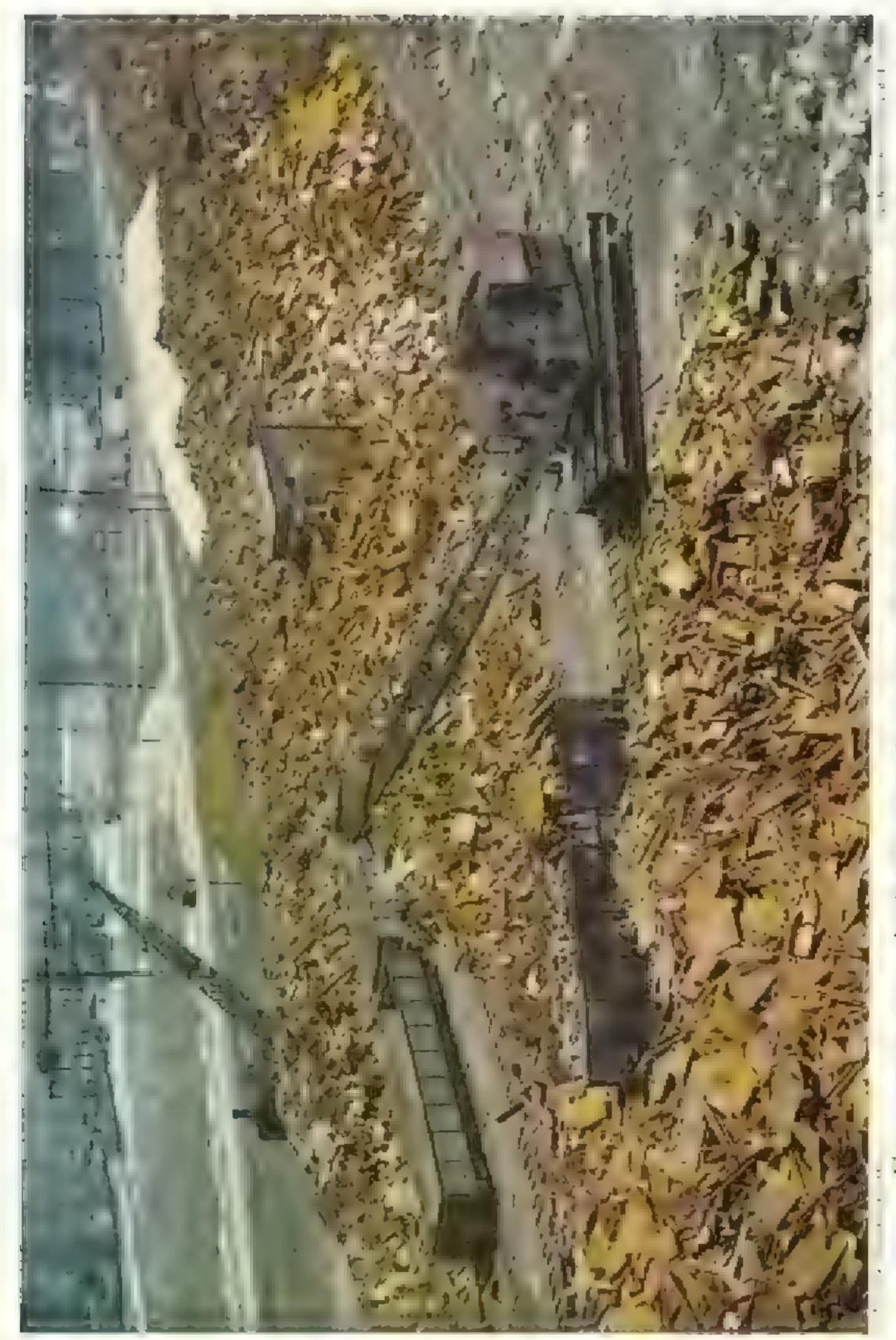
In the offices of the American Iron and Steel Institute in the Empire State Building



Presente Pears Ire, See, Mather of Steel, from the Mesodo Rance's Emilione



in the History then I'm the thine Spines is I the Mangarday Grand Carret



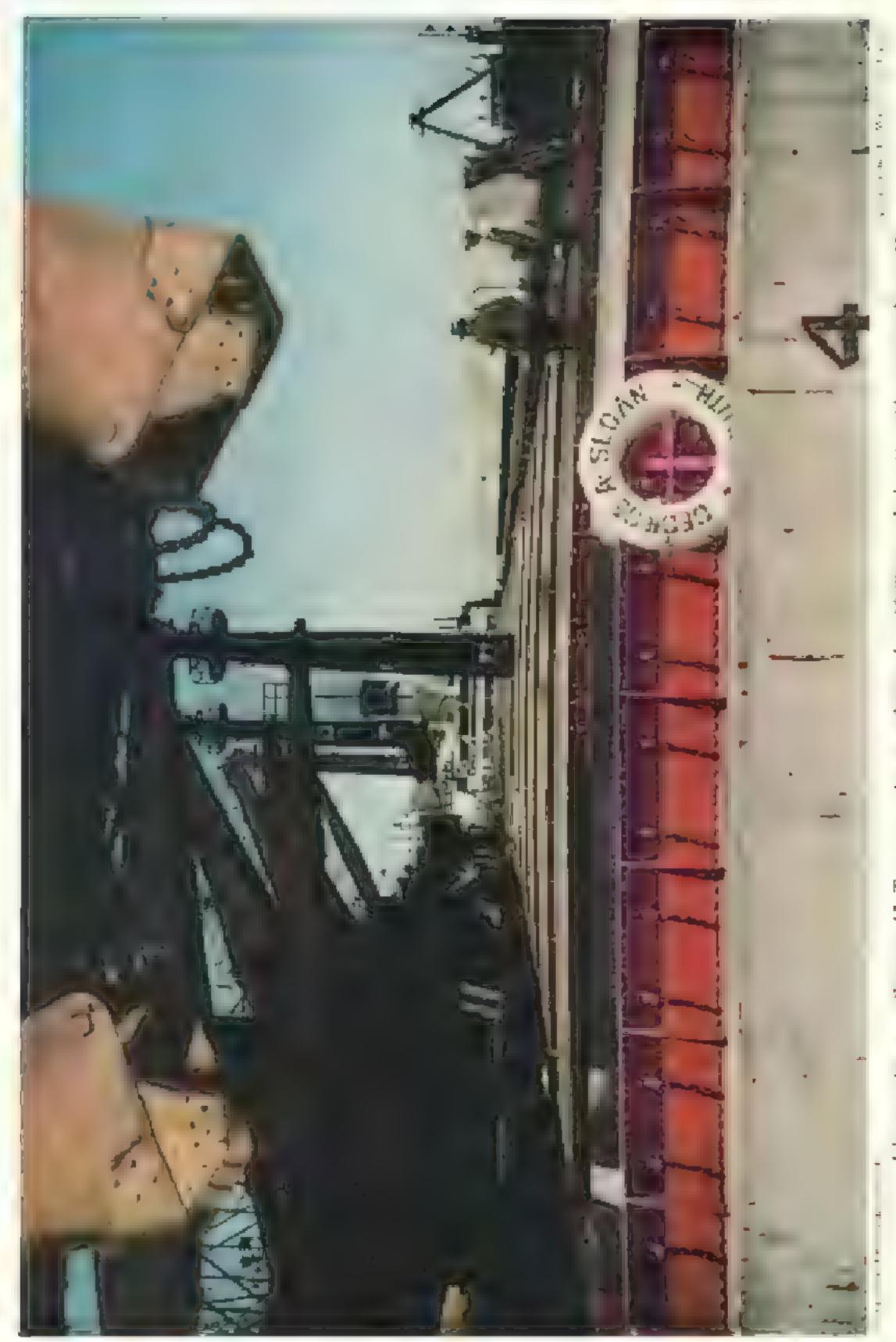
Jeen magnet c

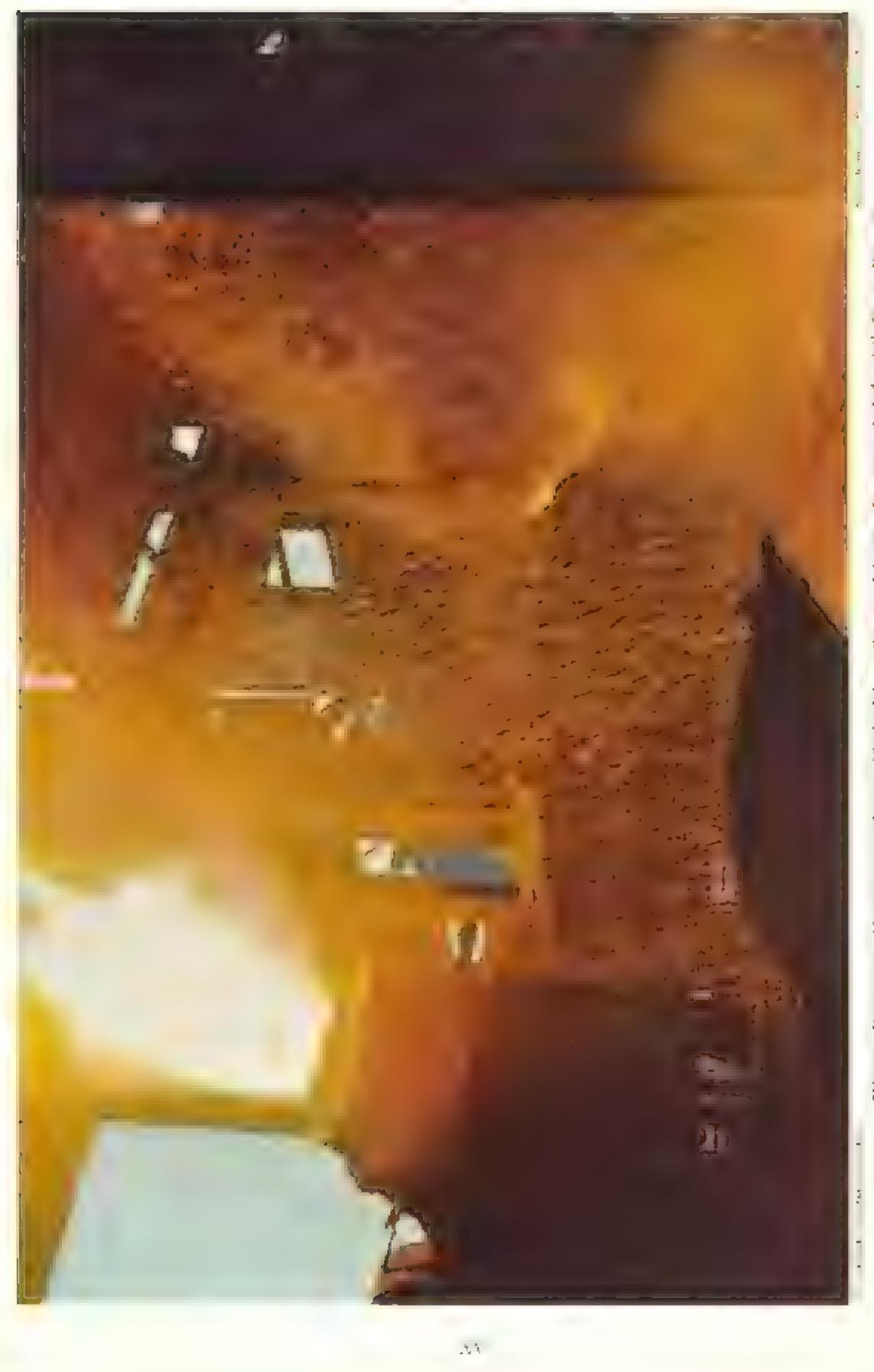


Gary's Rivering Blast Firences Smalt Ore, Coke, and Limestone into Iron



Grant I reresos cost es un Wieces Han. "Surp." Multen Ivin, le Conversora la Make Steel





While Beergney Connection Spans - HILL I did heard the

The National Geographic Magazine



the ten Largers C. It i Stee into Pope and West the Edge Without Process of the property of the property of the contract of th



Passing Back and Ford Between Girnt Rules on Invit is II thered to a Shib.

For the property of the control of the property of

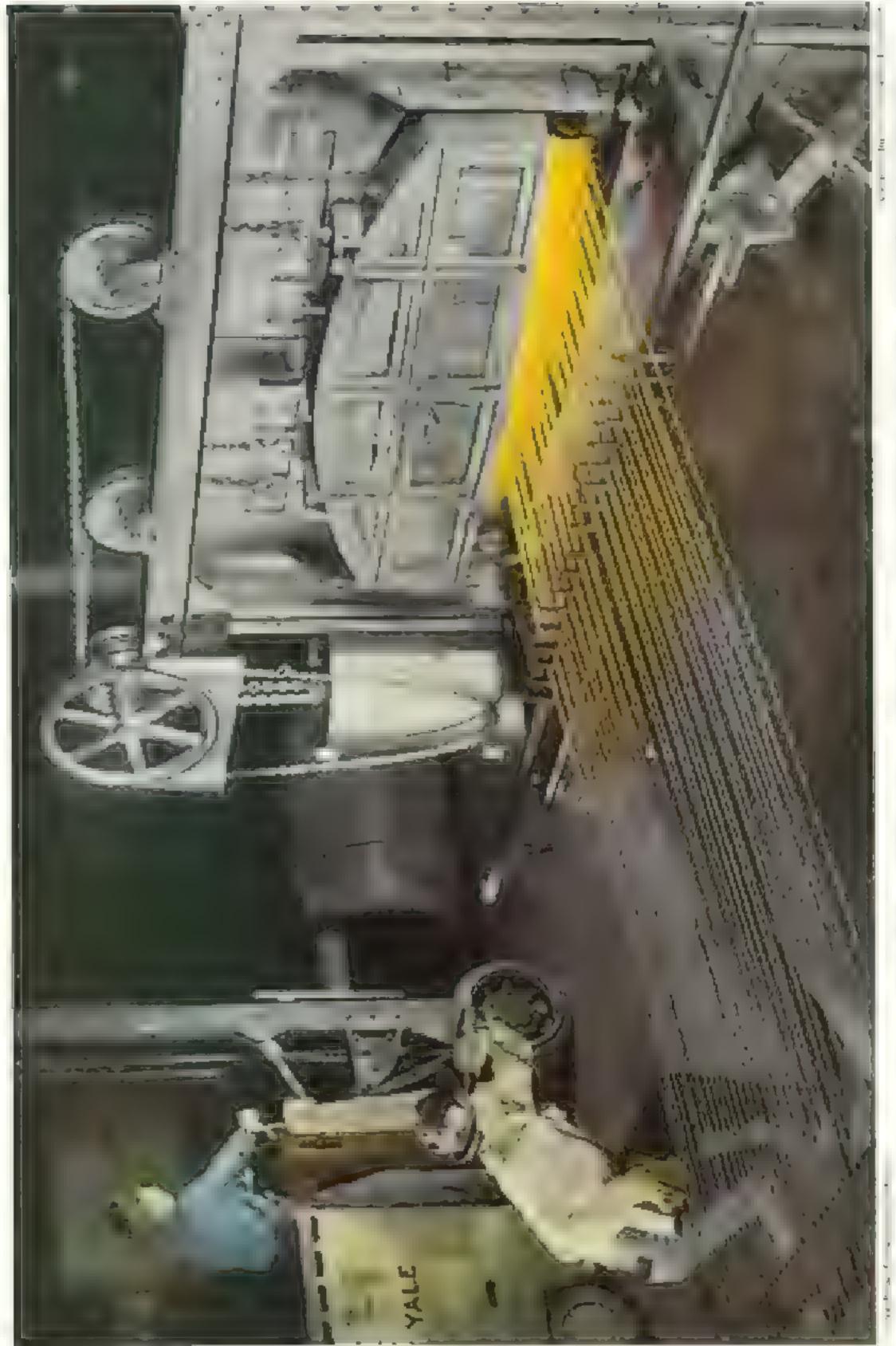


Ingot Maids I me Up to Receive Spattering. White-hot Sheet term a Spentang Ressenter A to the ultrabet term in the very of Y or form contract to the stripper line. The contract term is the solution of the contract term in temperature to the contract term of the contract terms.



SHIP OF

1, 1, -1 ·



Heart to a Bright Grange, Steel Rock and Wire Have Their Temperatures Checked as They Leave the Parenting Prenauc the second of the property of the property of the property of the second of the property of the second of the seco The properties of Sparity Com I shall be about an about the



"Souking" in 2.200: Heat Prepares a Small Imput for the Rolling VIII's I reques to the transfer of the South Control of the South Contr

in New York I held in my hand four soud, pieces of steel, all cut front the same sheet but each hardened by a different treatment.

The first could not be bent at all without breaking: the second took a right angle bend safely; the third could be bent marry hard on itself without a fracture; and the fourth, not only back on itself but also lengthwise.

A Strip Thinter than Paper

I also held, carefully so as not to cut my fingers, a piece of strip steel thinner than the paper on which I made too notes; it was .0015 in h thick. It would have been instructive to place this they ribbon besile one of the main girders that support the Empire State Brilting!

Let us lear in mind that in America the more modern aspects of the science of metal-lography, which has to do with the internal structure of metals, pe back only to about the beginning of the 20th century. To my an entirely new grain structure can be created by controlling and manipulating the heating and cooling cycles in steelmaking.

What this has meant in the manufacture of Imposets and Jedmets, to meating only two out of scores of thousands of products, needs no elaboration.

But just as fundamental is the fact that steel can be given a wide range of physical properties by adding to the nation it association regulated proportions of one or more other metals, known for this purpose as albuying elements.

All steel is alloy steel in the sense that it is composed of two or more elements. But, as commonly used, the phrase applies to steel in which such elements as manganese, alckel, chromium, to dybdenum, cobalt, tungsten, and vanadami—the seven principal albeying elements—are added,

Some alloy strekt may be two at three times as strong as simple carbon steel for equivaient sections

In some cases they are made to tesist rust and in genera to meet the demands of industry for high-strength products, notably in the ever-increasing specels and stresses of modern transportation. Jet propulsion made further denands thate 421).

While the uses of alloy steel run up in the thousands, the first great detrand came from the automobile industry. In fact, if the automobile industry. In fact, if the automobile had come into use much earlier its development would have been very slow, because alloy steel was not yet available.

Of the many families of alloy steels the public is most familiar with the staidess varieties, because they are used on the outside surfaces of railroad trains and for Litchen equipment.

Weight reduction has been a popular slog to, especially since the war. We bear much of lighter-weight trains and automobiles. "Lighter" materials are all the rage.

But there is ou such thing as 'light' or 'heavy' steel. All steel weighs practically the same, except for insignificant differences due to different alloys used,

What is meant by lightweight steel is usually some form of alway steel which, because of its appropriate strength or taughness or hardness or rust resistance, does the same work with the use of less material. In other words, more work is done by a section of the same work is done by a section of smaller size.

Most of the elements used in steel alloys normally come from strange and reprote parts of the earth made better known to us in the recent swiding fortunes of war.

Nickel come mostly from Canada, but also from Norway and New Caledinks. Manganese came from Russia, the Gold Coast, Brazil, and India; chromman from Southern Rhadesia, Union of South Africa, Greece, Caba, New Caledonia, Turkey, and the Philippines.*

Alloy Steels in the Wor

The war was largely a war of alloy steels. Not only the weapons but the tock and machines that made the weapons had to have alloy steel. In wartime the greater costs of the electric formace dad not so much matter (page 455), although alloy steels were and are made in the open hearth as well,

Despite the shutdown in importation of many alloys because of submuring warfare, it was possible to get by.

One reason asy in the recovery of alloys from scrap piles. Many thousands of tons of nickel, chrome, and molybdenam were obtained each year through the use of scrap material. In last, as much as 95 percent of the nickel used to tougher certain steels was obtained from scrap.

The best-known way in which the critical supply of alloy elements was stretched was by creating the National Emergency, or NE steels. These were "lean" alloy steels that proved just as effective as the "rich" ones.

The Secrets o New Map of Sevent Rusia," Lecember, 1944; and "In this Treasure, Helped the Alber," by John Fischer April, 1946



Had Steel Makes Soft Beds; a Third of Our Lives is Spent on Wire Springs

The first that the second of the second that the second of the second of

It require from L. ... with the project II. No see the project and the project are suited as a result as a result as the American from a of Street I. Little on the part of metadurgists an deferent companies.

Into was because research had several years before propounded a multiple-alloy throughnessely, that small is a monoid of several number of dum and a logic pelegrapis whalk provement as effective as in each meants of newer after the contract of the several for

It was to rect the theory we lost of a first the sector court allow animals to receive the telescent of the first and the first surface of Stelingrad meeted of the telescent for the cult of the cult

I die an villen i. It feel in jerie i from other materials—from the lieft of a such as alominum and magneric and from plastics and playwood. In fact, the competition among different substances never ceases, whether in peace or war

But competer a works both ways on in the

metals may feel the complete of the dose

Of great importance is the fact that most materials supply need or coordinate with ster Otten the best results are obtained where there is a muoa of two groups or much as such as steel and aluminance, steel and reservoirs.

I described to be the case in the construction of an item actions in the and has a will be at the interior are assessment of the errors.

and the late there will an a control of the man and the late of the forced stimulus of war. See a return to easily an aluminum, magnesista, and plastics, vitals important as they are, have never been at aluminum as they are, have never been as a dated in quantities sufficient to provide our more than a fraction of the man of this applicance.

Steel accurate for more than 93 count of the production of all metals a charal. No wonder it is the master of them all

1 res Kommer, National London Majors

() 48

Finding the Tomb of a Warrior-God

By William Dungan Strong

Louisat Protessor of American Arcambigs, Comming University, and Chairman, Lysin by of Andrea Research 1990

H. h. Constrained trees In the place to be them the the health to them. Columbia Con the

In the Vira Valley of Peru some ten centuries ago dwelt a living god, a warrior-priest generated by the Mochica people who developed a brilliant civilization on the northern coast when Europe was deep in the Dark Args. Last June, on the final days four field work, we were fortunate enough to discover 16s to mo

This editorial "we" represents the 1946. Columbia University Archeological Expedition to Peru, including the writer, his wite, and his assistant, Clifford Evans, Jr., who as a combarder officer had been allown out of his plane 25,000 feet over Hambarg and less than a year before had been released from a prisen camp in Germany.

Now back in our own chasen study the history of man through the millennia—we were hoding a lot to learn and much to unlearn in Pers.

New light was being shed upon the life of the vanished Mochaet, who, our explorations now proved, flourished much later than bulbeen thought. We know at last that the riod of their ascendency marked not the reginning of native rivilization on the north treast of Peru, but rather its apparently based not very builtight if weeing in the period between the Callings calture, which has left us ruins of great ad he castles, and the rise of the Tianganaes and Chimae civilizations.

Preserved in the dry soil we found intact not a dy examples of the splended art work of the Mochica Let some of the actual food they are and pottery representations of their deer on the chinax was the resurrection of oso At appear's houself, one of the last of the Mochica warriot-presses, who had represented in his person the great langed februe deity of morent Peru and was buried with the body of a sacrificon boy beside him (Plate 1).

Dead City Covers II Square Miles

After the diwnful of the Mochka there arose the Tabercaco civilization and the coastal empire of the Chimu kings, who in the only die of the 15th century, dominated the northern coast of Fern from the towering Ander to the blue Lacific Ocean.

The capital of this constal empire was the city of Chan-t han in the Moche Valley. The to us of that apeat dead city cover 11 square rules, and the many carefully planned high-walled companieds, the reservoirs, the intricate irrigation partients, and the temple mounds, even in their present ruleous state, bespeak a very highly organized and esthetically advanced government (page 462).

After then ishing for several centuries, however, the Chicar Empire and its cantal were conquered by an even greater native American turpire, that of the Incas. But in turn the Incas themselves were caught in the intricate web of history, and their dominance was as brief as it was brilliant.

In 1532 a small but interpid army of Spaniards under Francisco Pizarro landed on the northwestern tip of Peru, and within two years the empire of the Incas followed that of the China, and the still carlier kingdom of the Maching into obsessor,

Each of these great pre-Columbian empires and kingdoms beit for more than their extensive rains, for many of the people of each survived and blended, and today their descendants form the larger part of the population of modern Pero

Six Expeditions Focus on One Valley

If was this continuity of very ancient and median cost waters that led to the selection of the Viru Valley as the scene of a unique program in 1946.

The Virit Valley Project of that year was organized by the Institute of Andean Research, in ide up of North Austrian and Perturian scholars representing numerous universities, museums, and similar scientific

*See "Air Adventures in Peru," in St. best Subject Names at the second Managers, James 1801 and "Heart of Aymara Land (Tabuanaca)," in Section E. M. Millin, February, 1927

I Printamed "Eve a peak"

the latte Name and Long exercit Machania, "Income Empire Budgers of the Andrea" by Philip Aimmonth Means, belongry 1stes; "Sury of Machania forth. The Fernand Typed home of the National Geographic Suncty and Yale University," February, 1818, and "Further Exportations in he Land of the Incas," May 1916, both by Burner Brugham; and "Pith of Pira," by Henry A sert Philips, Assense.



War in Archeology It's All the Same to a Jeep

Inside and the first of the first that the country properties the first and the first transfer and transfer and the first transfer and the first transfer and the first transfer and transfer and

or arrestions and the of the particles and ancient civilizations of the vast. Andran recton

in 1941-1942 the Institute of An lean Research had sponsored a far-ling and soot out to program upder which some ten expection and to the interpolation of the first way are strong northern Mexico to Chile. In 19-3, was desided that a compact in program should be launched, but that work in one are a the Viri. Valley, each concentrating apon a different aspect of the valley's total cultural history.

The working plan encluded human geography, eo er we have been limited and to be logical research. Parterpating in various phases of the coordinated research program were the American Museum of National History, the Chicago Natural History Museum, Chinabia and Yale Universities, the Smith some control of Doth the Institute of a studies Ethelogicos and the Museu Nacional Antropologia y Arqueologia del Peru

The small Vira Valley, about 25 mines of the modern city of Translo and the amount

stes of Chan-Chan and Make, was a to arried heralise it is one of the smallest valleys, in the very important archeological arrest north coastal Peru. This may a red it a happararch method of choice, but a limited area permits greater concentration of effort.

The men who those the site had all worked to be the large to be a relied to her archeological remains is this entire to a rether, the Viria Valley had in part on archeologically explored by Schor Rafael Large Hoyle. It is not of the Most Arango agic of Rafael Lord Herreral at Chichm in the Chicama Valley, at thy Dr. Wendell Chemett of Yale University. This work had shown that there was a long and important human record by

Ministers Valleys of the Nile

I is a the purpose of the Virit Valley Project not merely to explore but to bring together and relimited geographical, archeological, and a seconomic study of culture thinge, through time and space, in one isolated Peruvian valles from the cartiest-known human occupation to the present out



Here Lies a Michiga Child, Wrapped and Boried with Loving Care

A trace to the property of the

I con i-percent and pend, we combined to all valleys, large or small, is like a little Valley of the Nile, being similarly isolated from its neighbors by great stretches of atterly harren desert and countains

ontact between all parts of Feru, but there was their my Pun American Highway and elliptic, it is own peculiar history on while the figure Penvinn and Pan-American movements have left their tesperties to the

Where we have the tomes down to the high series as for as the water can be an ideal the desert blaoms like a fact to (map, page 457, and page 400). Such a dieval of the been ideal for himan habitation for thousands of years. The near-equatorial climate cooled by the Humboldt, or Peruvan, Carrent from the Autatatic. The sun subass nearly every day, with heavy rains only at intervals of many years.

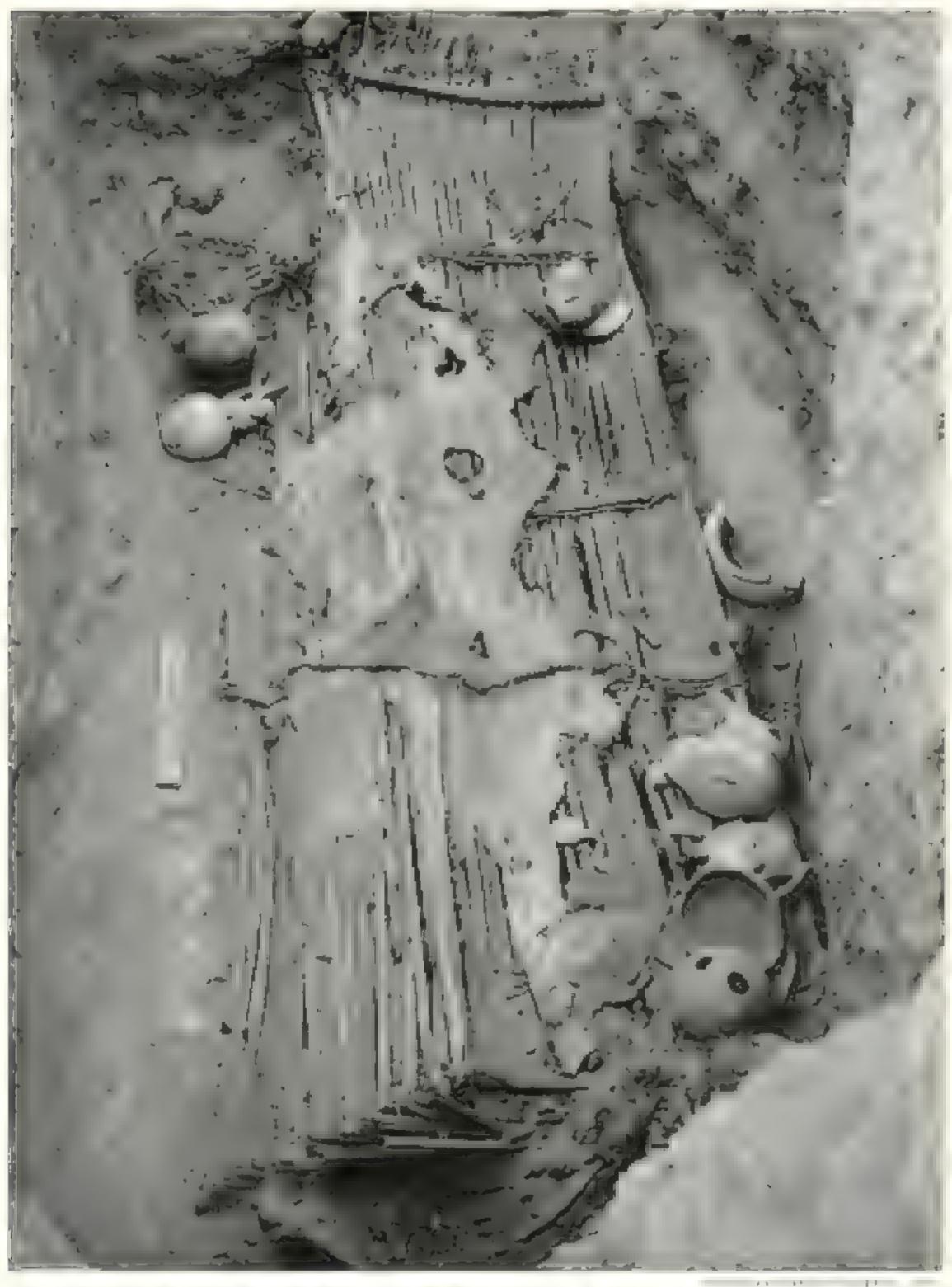
Thus the prelist ric record of coastal Fern is an analytich, and the small Viru Valley will at II have many secrets to reveal to grafter the explorations of the six expeditions, and many others, have been completed.

In the present artice it is possible to detime in detail only one of the of the discoveries made by the Columbia Liviversity unit of the larger Vira Valley Project Equally important results were achieved by alother cooperating expeditions, but these will be presented in the reports of those who do the work

The major work of even the Colombia town that, one four months of minimal to the line of the contract of the line of the contract at the sum of the statistaphic sequence as time and funds permutted. This was pecomplished by numerous and very the district of the least twelver, at various key sites in the value.

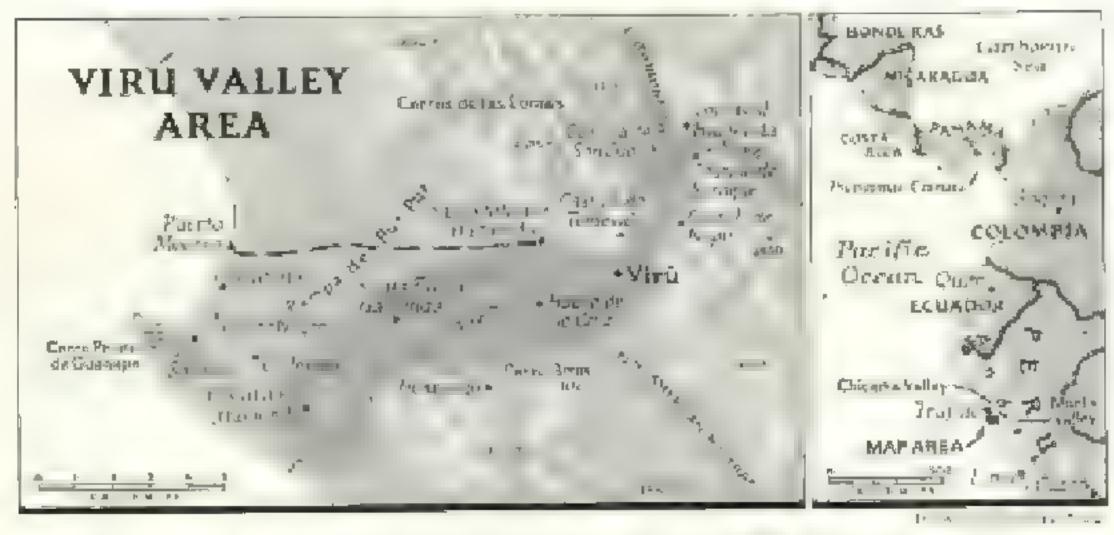
It is a tiers comes nearest to writing, for it partied, modeled, or its of direction or ever one often. First the teason it is an itselface the index of the changing stages of prehisteric development.

We care or possible we excavated also a few



Two Worken Accompanied the Warrior-Priest-God on His Lond Journey Death Notes and and on the trace of the form of the form of the state of the state of the form of the form of the state o

e plant at the term of the property of the pro



Where Water Makes the Desert Bloom, Man Has Lived for Thousands of Years

Trement to the formula to the first tree to the comment to go in the production of the state of the le Torrated, Gallieure Geschape Husta Negta, and Husta de la Ceur, where the Columbia University per the first the first term of the contract of the contract of the first term of the nundesert area, brigated by the Varia River

busials of the various cultures so that the complete pottery lots from the graves could be compared with the broken puttery fragments from the respective levels of the rubbish пеаръ.

Thus, in a sease, the discovery of the tomb of the Mochica warrior-priest-god with which this article is primarily concerned was merely a fortunate by-product of our major task.

Jeeps Aid the Modern Archeologist

Thanks to the generosity of the Viking Fund of New York, all the Justitute of Audean Research expeditions shared a butch rooftop laboratory in the modern city of Trujido, in the Mothe Valley just north of the Viru Valley (Paute VI).

From this vantage point of four stories we emild look west toward the Pacific and see the great dead Chimu topital city of Chan-Chan, Looking southeastward toward the Andes, we could see the famous Mochies rules, the Temples of the Sun and Moon, at Moche

(pages 458 and 461).

In addith a to the laboratory, the same central service fand also provided all of us with two war-developed techniques which proved invaluable. These were three United States Army surplus jeeps, a half-ton traffer, and two complete sets of photographic alr maps of the Vira Valley, purchased from the National Aerophotographic Service of Pertt.

These maps, with the jeeps to take us to the sites they so clearly indicated, sped up all

aspects of our combined work to an amazing

degree (page 454).

When the Columbia University strangraphic unit began work in the Varu Valley, we believed, in comm in with the majority of archeologists, that the four great billtop temple fortresses guarding the central Vira Valley had been built by the Mochka, as were Moche's Temples of the Sun and Moon. Hence we started work at the imposing Castillo de Tomaval to see what by below (Plate IV).

To our amazement, work on the side and top. of this deminating fortress soon showed that it had actually been built by an earlier people. a local Vira Valley formative civilization which at present lears the unaltaring name of Gallinazo, or "buzeard," from a type site in

the lower valley,

Spacred on by this discovery, we due soveral big treaches reaching some 25 feet in depth (Flate II). They indicated that all the underlying deposits here consisted of canemarked adubes, unlike the plain adubes at annwn Mochica sites. These lower harizons were further characterized by unique, negative-painted, and vivid but crudely modeles. pottery types which are characteristic of the Gallanazó culture.

Apparently there was something wrong with the generally accepted Peruvian culture sequence (see diagram, page 464), for below this Gallipazo borizon we found an old whitean-red pottery horizon, known as the Salinar culture, whereas the reputedly ancient Mo-



Time Has Figurescal be ancient Free of the Great Machina Temple of the Sons

and the first section and section and section is a substitute of the Machina per the section of the section o

the a pottery made caltural remains appeared only on the surface at the Castillo de Tomas al-

Manuny in a Chicha Pot

An interest to the process of the second of

White control is a function of

we could note and the weather of a comparation of the property of the comparation of the

On which the past med to pre-empted them for their own home use for the same property and years ago. The past med to pre-empted to a same of the same are closely linked in long.

If the great of the property of the Variation of the Vari

Vied, it was obviously important that we find on I whether this was also true of the lower valley where the great sits, or sits, of Galli-

mayo dominated the scene

Once the center of a rich and abundant life. this region is now devolate as a result of modern charteal buttility and booking. It is deserted save for a few wandering burros and scattered flocks of goats and kiels which browse amid the terrible thoms of the algarr that this kels. The thinks are guarded by smart fittle black degs, which by day keep an aye out for swamping conders god at evening brive their charges home to their of wiferous but safe thom-brush pens,

Hoping to encourage more monte, or brash, for both browsing and soil cover, the local people bud thorded much of the area with the exerchandant water residing from unustally heavy mins in the highlands. Lagoons thus formed had attracted reseate flamingus, white herons, and breeding tree ducks which seemed strange and brilliant comparions in the milet

of this recently man make desolation

The Gallipaso area actually includes six major groups of rijes which stand above the

plan in I mely grandeur.

Unlike the great castll as of the middle valey, these lower ruins are suljected day in and day out to the sweep of the prevailing southwest winds from the sea, and these have remailed every contour of whit once were

angular buildings and pyranidds.

Indeed, as we found later, these ever-present winds are constantly removing layers of the Id deposits, and It is an impressive indication. of their original size that the highest of these minume, still loops some 74 keel a rive the level at the surrounding plain. Neither time nor the Conquistadores and their successors, who have ceaselessly dag in these structures for treasure, can obliterate the grands in and signs of abundant life that once existed here.

Use one very deep stratigraphic pit here, as well as Dr. Bennett's detailed architectural studies for Yale University, indicate that the Gall ipaso rulus, one tever over another to be to a depth of almost 30 feet. Here . . . w formed that all the major structures belonged to the Gallinge's culture and the lowest levels to the Salmur culture, with its white-on-red potiety. The only Monhaid remains were on the very surface.

Lucky Accident Leads to Discoveries

Thomas to a lucky but at the time unplease. ant is cheft due to flood waters from the highlands, which blocked the roads to Gallinazo, we were forced to explore for new Funds and thereby found clear evidence of still

carlier civilizations in the I wer Vira Valley.

At the little fown of Gazdape, In colonia: times the metropolis and scaport of the value. but now a small fishing village cut off by the Pan American Highway, we made some of our most important scientific discaveries.

Hate we from I a littrial ground of the Sali nar culture which yielded complete puttery. of the type we had found only in fragments in the lowest levels of a ar cheep there has at Castillo de Tennaval and at Gallingso. This is

aa important early pettery horizon,

Then in the desolate that large black mound at Hunen Negra, previously unknown to science, we found Coastal Chavin, the earliest softery culture of the north coast. The finding of a treate rook temple, with sacrificed Hannas, gave more detail to this earliest pottery-making, com-raising civilization of the Peruvit n coast.

Primitive Gueñepe People Grew Corton

Most important of all, we discovered here a pre-pottery civilization of long standing in which the people grew catton, and raised squash, lacuran, nod other segetables and fruits to supplement their fedire details d i not grow com or a sow any type of true weaving, though they twined cotton into chith in the manner of basketmaking,

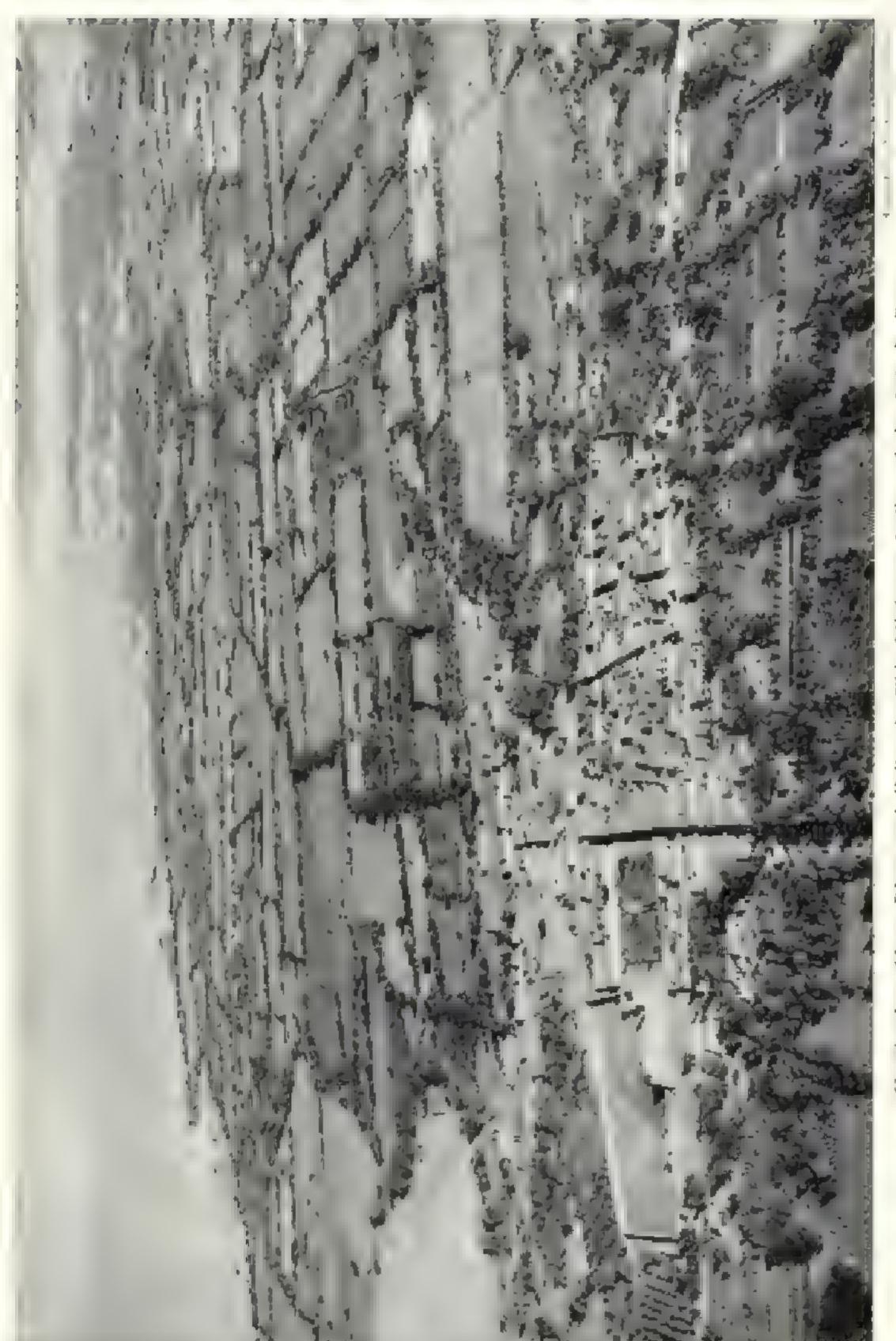
All this, however, is another story. Junius Bird, of the American Museum of Namual History, arrived just after our discovery and. since his just of the Vira Valley Project was e accerned with the pre-pottery cultures, we gladly turned over this aspect of the work into his very able hands (pages 465 and 476).

Working in both the Viru and the Chanma Valleys, Mr. Bird has not only secured many data on this new and exciting pre-ceramic noticut but has also discovered a possibly still earlier stone-using and hunting culture in the upper valleys of the coast (Plate VIII).

We were free now to concertrate on the actual place of the brilliant aforbica civilization in the galtaral sequence of the Viru Valley. As a result of our work thus far, we knew that the former story of culture growth in north coastal fern was hecomplete and, is: places, incorrect. A revised picture was tak

ng shape.

First were the hunters represented by thipped-stone-using peoples in the upper valleys, and fishermen-farmers, without pottery, on the coast. Then came the first pottery makers and corn growers, the Crastid Chavin, or, as they are known locally, the Cupishique price Dark Prince Secrete as 5 limit peoples, who made the white-on-red puttery, and, after these, the Gallmazo people who



A barber to



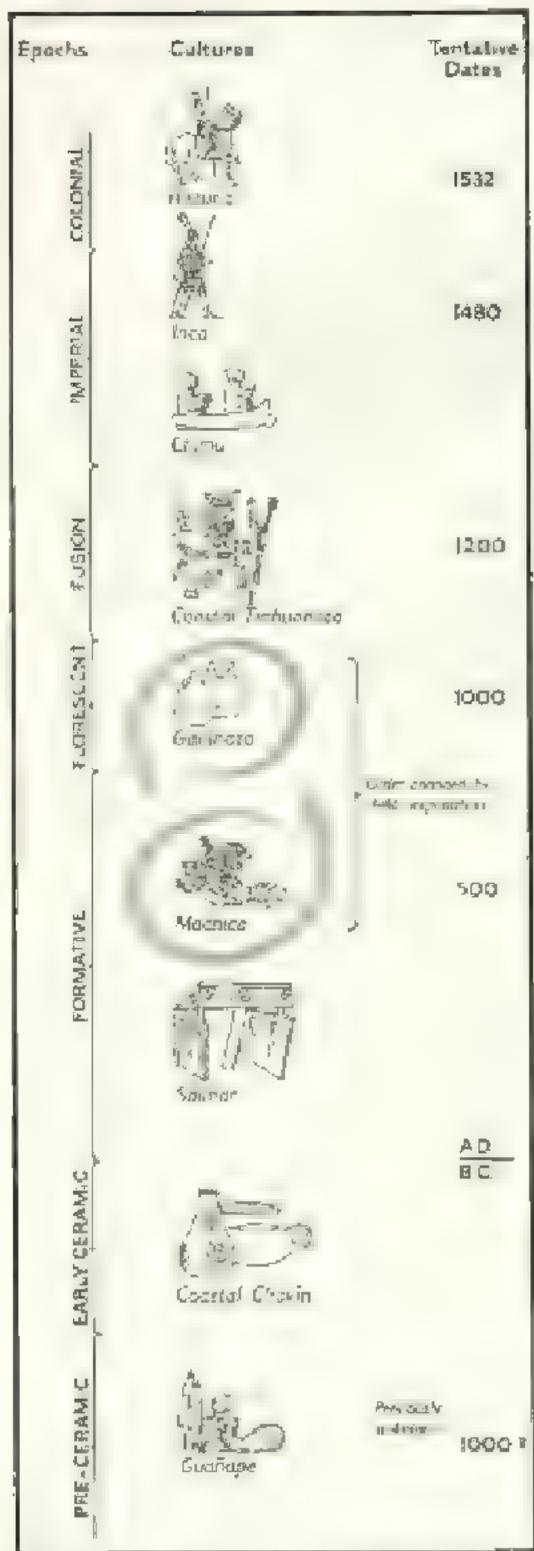
Vietnam the

9





Primitive Americans times that mand Squash Refere the lines of t Fore on the British of the Brind Photos



febanti fie feren b. iff boge

Mochicas Lived Lates than Was Thought

This chart shaws how had year a work revised the chromology of peoples in Peru's Vira Valley. Newly added not the fishing and larmont fastings told

compresed the long, local, formative epoch of civilization on the north coast

We felt sure now that the Gallings of etalliant Machine period, with its florescent act styles, but we had not yet proved it by direct stratification. Therefore, knows and I left the remote past and concentrated on the problem of stratographically placing the Mochica culture in relation to the presumably earlier Gallings of culture and the later Tialmanaco, Chima, and Inca civilizations in the Vira Valley. The exact stratigraphic sequence of these post-Mochica cultures was subsequently brilliantly demonstrated by Mr. Denald Collier of the Chicago Natural History Museum.

We had planned to carry on our work at the great temple site of Hameneo, under the bills on the south side of the Viru Valley Surveys by James A. Ford, of the Gugunheim I-ambation, and Dr. Gardon R. Widey, of the Smithsonian Institution, had indicated that this huge, lonely, and impressive structure, built entirely of adobe bracks with our canemold marks, was actually of Morhica origin. However, the same survey also indicated that Mochica refuse deposits at this site were only three and a half feet thick and that below this depth the soil was strile of human refuse

Graves Laoted by Treasure Hunters

Machina remains had also been reported from the site of Human de la Cruz, alaust it the centre of the valley, and we decided to try for stratigraphy here, despite the fact that this entire site had apparently been furned over by treasure has ters in both the recent and the remote past.

The site at fluors de la Cruz (Ruin of the Cross) covers approximately 10 acres and receives its modern name from a small smooden these on the top of the 50-foot-high mound which is covered by turned-over ancient praves and occupational debria (Flute V). Many of the ancient ruins in Peru are topped by Christian shrines and crosses, for the ancient cults and the later religion have often been denced in the ideology of the local people.

Unlike the sites of Gallinazo and Guanape. Huaca de la Cruz is in the valley's fertile heart, adjacent to the Pan American Highway, and its brown, seemingly bomb-tern desolution is suprounded by rich green combeble.

The core of the site is a small natural sand dune whose central area has been covered to a depth of many partis by ancient occupational and burial detritus. So dry and so thick are these upper refuse materials that one large area has been completely barned to a depth of two yards.

On the steface, some the ancient looted graves, we frund ling ments of pastery ranging from European porceating of colonial times to the very early white or-red ware of the Sallnar peoples of me Alli, Marabundant, bowever, were evidences of the Mochara and the Tra-Manuel and Chima civingations, the last of which just preceded the пса сонцием.

Very little Gallians is alternal material cultural material covered to not the arrangement of the arrangement of the exact relationship between this demonstrably old horizon and the still unplace. Muchina circlination but we were trying to retermine

Vided by 1tc, Benter who had excavated here in 1930, we effected an area - 15eral yards square on a ridge where the had queron of trans-unibarters, but not one so releasively.

This is usually a limit is insulated occurs ion materials, not graves, occur, for hoadqueros are interested only in the rather graves. These thay skillfully locate and over appraise under

graund by touch with a long steel probe called baqueta, the Spanish word for ramind. Since louting started with the Spanish Composit and has continued ever since, it is probable that the art of the coupets goes back to the sold as a C. Pizgero.

Having carefully cleared the surface of all of the materials, we due down by 12 inch levels, saving every fragment of pattery and other material by level. It was some clear that we were in Machine bruse structures, for the rectal case, and the same about a were not cone-marked and the rectal case, by the transfer of beautifully



Warriors Tapple in What Might Be a Prelistoric Officers' Club

In the partitude of the record to the Markon take and the epit has defect his batch one and produce the term of the transfer to the partitude of the transfer to the partitude of the transfer to the same of the transfer to the same of the transfer to the same of the transfer to the tran

painted and modeled . - well to be or household, Muchica potter.

After surprising there were a supdant retime of corncoles beaus, squash trade, politics, a the and other corneald materials will not be a survived from Machine timelit to the survived from Machine related to arrive this abundant Mochine related to arrive and distinctive architecture terminated abruptly at a depth of sex feet. At this pool, we encountered the remains of older structures made of cane-marked a labe bricks

The refuse within these earlier rooms was

characterized solely by negative-painted and other pottery styles pertaining to the Gallinard culture. Moreover, the perishable materials characteristic of the happet, or Mochica, levels became scarce and then disappeared in the lower and older Gallinaro Jevels.

The cancemarke I adobe structures and refuse of the Gallinazo, or Formative, tivilization continue? unmixed down to a depth of more than 12 (cet, where we encountered the

unturni Sand of the original dame.

To check this seeminally positive evidence of direct superimposition, we made a second stratigraphic cut of the same sage in another portion of the site. It continued the above

sequence in full detail,

At long last we had settled the question as to where the Maching belonged in the Vitu Valley sequence. There, after four months' search, was clear proof that the betters of the great Mochica civilization had come into the valley at the time when the Gallinazo culture was in full flower and at Huaca de la Crux had erected their town on the ruins of a town of that earlier valley people.

We had only a week of field work remaining, for it would then be necessary to return to our hotel rooftop laboratory in Trujdle to study, repair, and photograph our collections. However, other direct and susprising evidence still awaked as beneath the form-up surface of

Huaca de la Cruz.

Having trailed the M schien this for, we decided to devote the last week to what appeared to be a rather forforn hope—the search for undisturbed Mochica hurials which might shed more light upon their culture. Since Haata de la Cruz has been torn up for centuries by treasure hanters digging for timbs, we were not optimistic.

After Three Days, a Tomb-Empty!

The first three days we concentrated work or what our real tells of the a deep Moshica touch. As we dug, we were disturbed to find large fragments of the Machina vessels in the grave shuft; but the men said that these must have fallers in from above and that they thought the main grave was minut, for there was a bollow cane leading down and they believed the fill was undisturbed

Such hollow cames, sometimes solid poles, often many Mockies graves, terminating just back of the head of the grave's occupant. It is possible that offerings of thichs were poured down them and that they also were thought to permit the dead to prenthe.

It the end of the third day, and at a depth of 20 feet, we found the tomb—empty. It had been botted many, many years before, possibly

I his is a most dangerous technique, especially at such a great depth, but one that is still common practice atmong heappared. It was this sidewise approach that had looled us.

We were all the more disappointed because the tends was of a Chicama Vadey type, being made of a lobe blacks with side at hes for offerings and having wooden roof beams. The puttery, carelessly beaken and thown ande by the treasure limiters, was of a fine white and ted type, more characteristic of earlier Mochica chica sites in the Chicama Valley than of the later Vira Valley Mochica.

Undisturbed Graves of Unusual Type

With half our time amost gone, we extended our half of the land to be a said to be a proviously located Mochica graves. These, bowever, were shullow, six to nine feet in depth, and the tombs were of tied cones instead of adole

Unlike the conventional Mochica graves of the carrier period, these day not extend down through all earlier rubbish into a united sand, but terminated long before that in the midst of the underlying Gall, nazo rubbish.

Then at last we began to encounter undisturbed graves, all of this rather unusual late

Mochica type.

The technique of working out these burials had already been well established. Our workmen, "el Professor," "el Perrito," and others, had edapted their own local techniques to ours, and no time or scient fic opportunities were wasted. The workmen would dig their test pits and then, if they thought the spot promising, they would call Evans or me. If it he ked productive to us, we had the men due down to the top of the grave proper and call us when the upper portion of the grave offerings became visible.

The clearing and recording of a single grave are slow and painstaking operations. The soil or sand must be tensived with trownle and brushes, and every object and bone tecorded as to its exact location. This was done by Evans, Mrs. Strong, and the writer,

When all the dirt was removed, I hotographs had to be taken and diagrams made. Then the goards or other coverines were removed and the process repeated, until finally only the skeleton remained.

Rules Ponce's painting (Plate I, apposite page) of the long-tucked image uncorring at Hi and shi in Crue Peru, by the Culombin I niversity Expedition, was a fine of Archeological Magninguts and Director of the Museu National de Antiopologica y Arqueo, March , Archeological were deposited.



Beneath a Juguer Headers of results Michael Cod of Fernies



Diging frenches 25 Lee De p. They Learn Cast Ho at Tenes d's America Secreta

Finding the Tomb of a Wagner-God



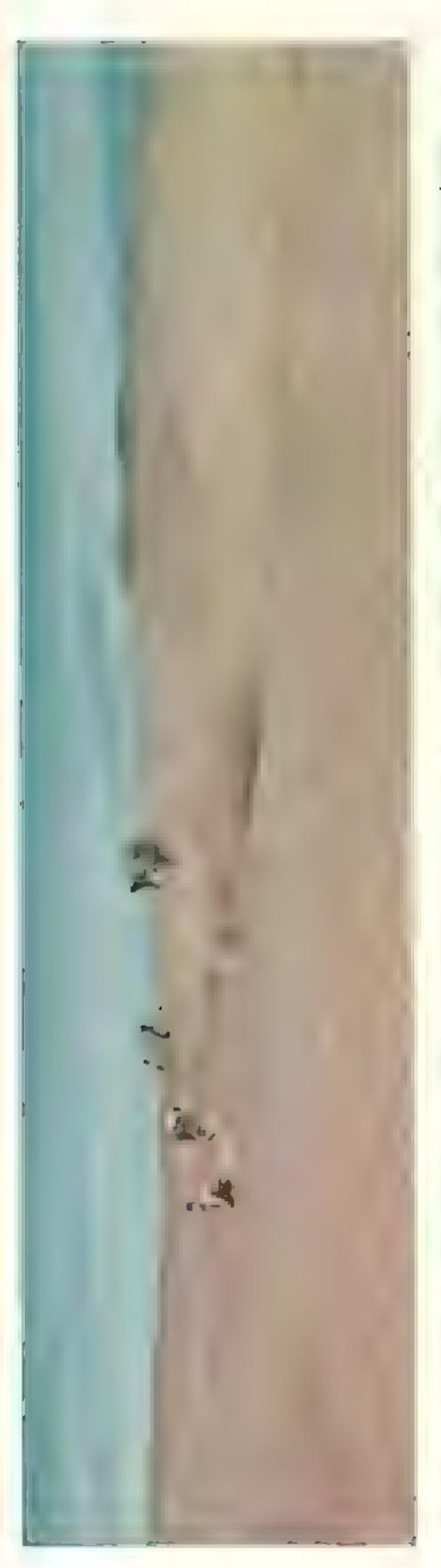


Des Fills the Are is There From te a Vactice Camber 1 or Tavers

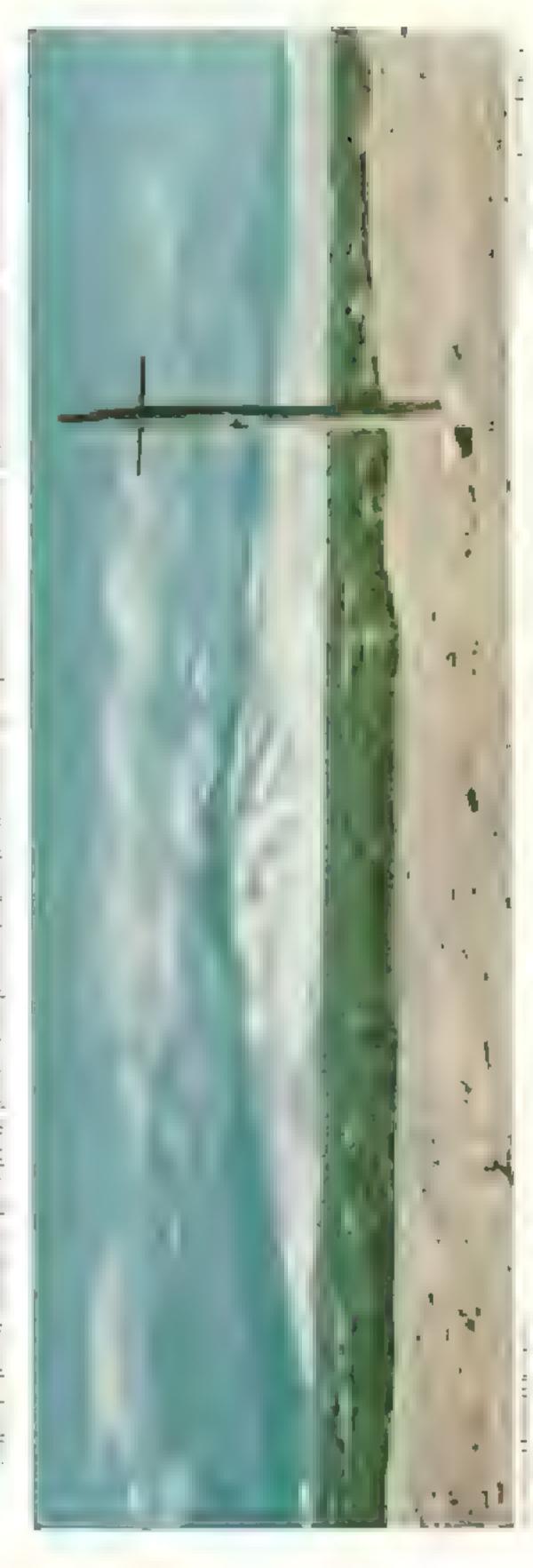
On the Area of the Area o



TY



the property of the second of (2) plant that of the Cambridge Roll Even Severance, Open times at the Sum Caber's I when the tens in king but this appropriately the Cambridge of the Appropriate Cambridge Sum Caber Cambridge of the Appropriate Cambridge Camb



then the man with the property of the property A Christian Cross Same's and the Ald Pagan Sate of Haron de la Cross Ramon of the Cross Same's Exercised Liver de Andres the contract of the the state of the contract of the state of the stat alayary letted Il re n to agend to the series of a condition of the cond



District Pres and Present Meet had Redsep Laborations

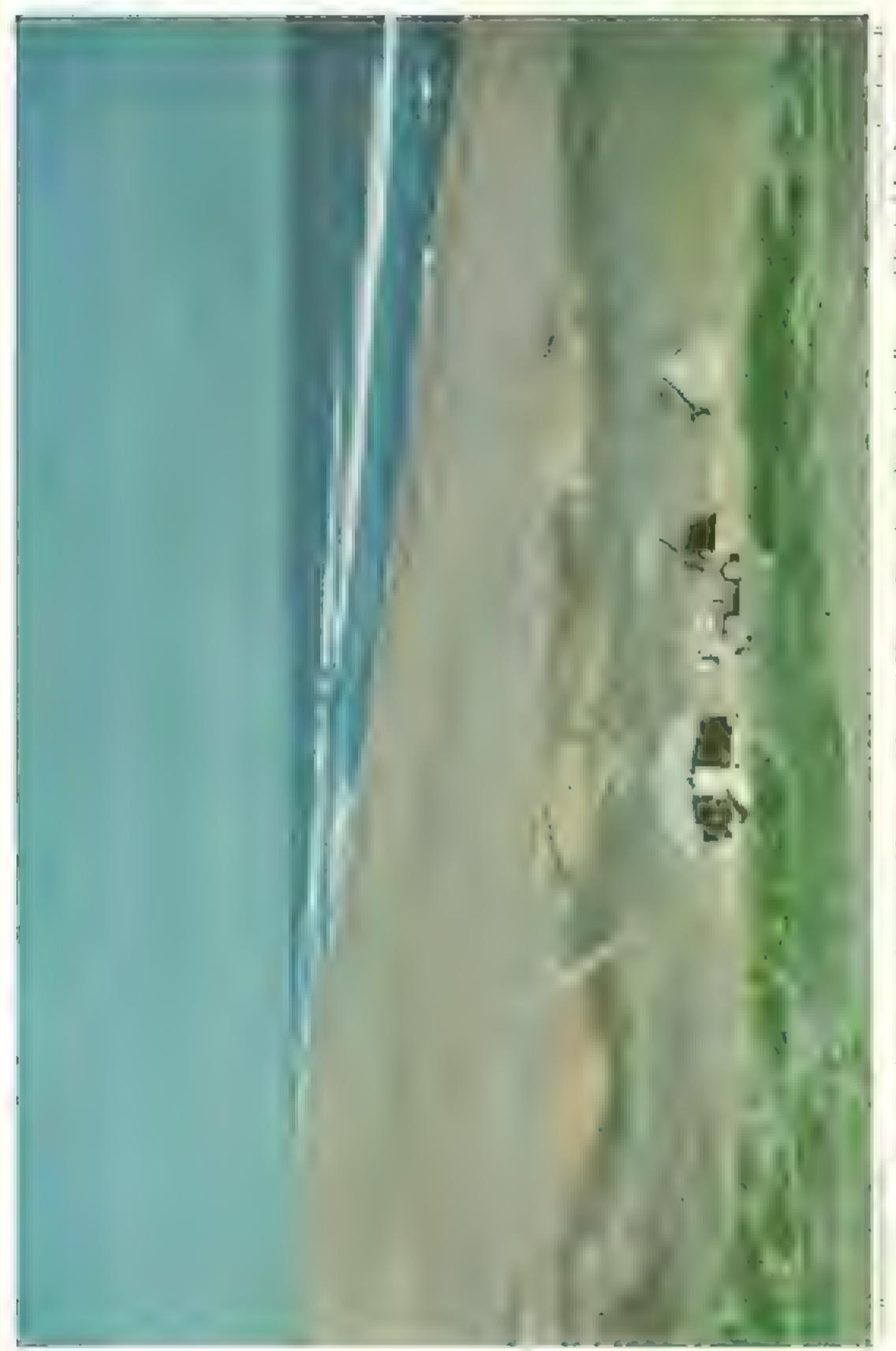
Finding the Tomb of a Warrior-God



September 2 Per aud Perta t Vise Show Printer Free and Fall a Hemblegs

1 Malica graves at Hora di la tra. The Malica white, red and back one at his
mas legged and the accord. The first and a research of the second





Natural History I speed from Pitterson for Poster and P. Acad his Justs Maps no of There is the Wate Partie the American

The skeletons at theaca de la Cruz were amally in an entreprely fragmentary state and, when notes and photographs had been completed, they often crumided to this tot touch. However, in some cases, particularly when the bones had been in contact with copper objects, they could be preserved and were carefully saved for further study.

After the third day we found several hurials of Mochica children. These were usually wrapped in twilfed cloth, a unique type of Mochica textile that is very care in muscumor bections. Some were also wrapped in cordings and covered by cares (puge 455).

Only a few fragments of bone remained in these graves, neglite the fact that the cloth, corfuge, and covering calabashes or gourds

were often well preserved

The children's burials were usually accompanied by several pottery vessels of late Mischica type. These had been made in molds and were claborately painted with white, red, and black designs. The vessels included barman figurines, wemen beating drums, and whistling jugs with characteristic stirrapshaged spouts.

Although the jars were elaborately decorated, they were samewhat crude and slapdash in execution. This i at, like the presence of the black paint, indicates that they represented a very late stage in Mochica culture.

Evidence of High Chi d Mortality

From the relative run her of young children buried, with and without their mothers, one would judge that child mortality can high during late blochics times at Huaca de la Cruz.

We also encur three several larged with of with women in those last few days. Two of these were particularly striking. One seemed to have been a much-bonored older woman of high rank and the other an equally honored young woman of about 20, who, from the peculiar content of her grave offerings, may have been subset the cherished wife of a mulitary community of perhaps a men her of a

Mochica women's army auxiliary.

The older woman was completely enclosed in a wrapping of heavy canes which were tied together at both ends and the middle with flort ropes and then covered with a layer of thick twilled cloth. The grave was shallow, less than a yard in depth, but there was every or, is not of painstraking care about the burial. Outside the cane cover, at her right shoulder, was a woven basket containing spindles for making thread; also needles and a goard sports. By her feet was a large calabash containing muspan cotton.

At the woman's left shoulder were three fine pottery vessels, our shaped like a dewer put, or flavere, one with a spout and handle, and the third with a stirmp spout. The last is particularly interesting because it bears a strange figure called "cat of the moon," since this mythical creature is usually associated with the moon in Mothica art.

When the cane cover was lifted, the body was found to be wrapped in a fairly woven white parment devotated with brown designs. The body was fully extended, as are most Mochica burnals, with the areas at the sides, the knees drawn together, and the legs, foct,

and hands all fully extended,

"Charon's Ohr I" of Ancient Peru

The head rested on one calabash of d was covered with another. Around the neck was a shell recklare. In the mouth, wrapped in cotton, was a capper plate, and each hand held a similar object, like the ot pper com which the ancient Greeks put in the mouth of their dead to pay the ferryman for their passage across the river Styx. This "Charon's obol" in the mouth is characteristic of both Machica and Liter Chima turinds

But the most remarkable relic with this highly honored weaver of late Mochica times was a unique wooden, copper-tipped abject, probably a ceremonial distaff, about takes feet long and carved from very hard algorithm wood. The upper, four-pranged end ture above the scated figure of an elderly and dignified Machica matron, who is faced by her two lattle page boys. The lower end of the cistaff tas a socketed copper paint (page 477).

Since the wite range of Mochica art rarely shows winten in any other than menial and often and guified attitudes, this strong carring with its great diprity and reserve helds a

unique and special importance.

The grave of the younger woman lacks the impressive unity of offerings that accompanied her offer compatroot in a rear-by grave. However, she too was evidently numbel cloved and baried with great care and impressive

efference

Her grave was also very shallow at 1 in the corner of a previously abundoned Mochica room. A ballow care tube extended from the curfa e down to the back of her head. The grave covering was of lashed cares and by her right side were two weaving backets with decaying oction and women spindles. Independent cover the body was wrapped in 5 bet matting and under this was a simple cotton that,

The position of the lody was the same as that of the other, but here the upper part of



Blackface Marks Him a True "Dart" Archaelocist

And the state of t

the head was covered by a calabash and the linest fact by a slightly modeled copper must. The latter had preserved the skull and Jaw and thus mude sex and use determination easis.

In the pirks mouth was a conjurt tuber nound her wrists were copper pendants; and her extended feet rested upon copper sandals. Her hair was comised into two large I mids the on either side of her face, extending with helps the shoulders and each wrapes with cut in string. A necktage are copper to be was made up of 12 strands of made to a por one strand of shell negri

the offerings with this burial were supprisingly varie. They imbuled the bones of two llamas, me of which had apparently been computated, since no skull was found. The other offerings compared and springered and other particular descriptions.

All, of these are interesting, but several me ouistancing. 7114 finest which W 21.5 litteken by turth pressure but proved restorable shows a strikingly mode ed fare of a warmoney madelesses with a pierced nose, earplues, and an elaborate headoress. The litter K too lebel and pointed Tebresent two very ifelike falcous was a ties our the fire : : e VII upper right). Other may with this element face and headcress have been found in the Chiama Vailey, possibly lava 2 been made in the same I ind there is no त । । । । त्वित्वस् or some individual If the seal plead, pr

I realistic is a land to a realistic is a special in a constitution of the second contracts of the sec

The most represent of a the special result is a large rule which had been fixed at such a

ligh temperature that it bad earlo led and is warped hadly met of shape. Un its surface is a clearly painted design showing a warrior in full battle equipment waving an empty older and rooming toward a similar male. The second area thought has approach, and the other and with hearth and a similar of a second area through the other and with the other age. Space with

When with of Valladle or Opings, this represented here one an ambiguous that when the form that the form the first three must be the first three must be the first three and the first three and the first three must be the first three and the first three containing

rattles that still make a lord suise, had undoubtedly served well to attract the attention of prehistoric chicks. 1 36 r sec

Why such specialzerl drinking equipment shuld be concentrated in the grave of a young woman we besitude to mus-

In several of the graves in this I want ne vicipity we bound politery representations i the great-fanged inguar god of the Make a whose tratter. same at there the - s. was Ai apage. The it par-god consept is very old in Peru, being known as far book as t bayen tomes and extending through all intervening periods into he has tellg on, where is is name | Visacocha, Strikingly similar tusked feline gods are also found among other native American aurisauftmeiste as far mittle 18 Mexico *

We were interested in the dispresentable number of representations of All amore in this small, group of are pagestly related burtals, but were bardly supposed for the star-I se revelding of the At proof shifting and he tomake the contraction of the

CIUZ.

The actual shaft of this tomb had no unusauf features and was sink through Mochian rabbish on down into the obter Galbrago. below, A inrge, erect algorroba wood! cost or it by but the state of the z of serious to include the fire However, our wonder are a language والإنجام والمراجع المراجع المر

er as a in the nest

The first chieff of interest encountered was to the the correlations of the section White has been been THE COLUMN TO THE PARTY OF THE PARTY. feet in filling in the grave. Since it was in



Accorded The research Year was Mindaell W. Dinte Studies are Ameient Office

April anderly pres of entracted and that the continues of ereport of the talk from the price of a much become thinks a window The in he get carried from contemplic hard on a man hard by her if a district with all of an orderly wisted bardson as the fit is the fit of the fit

> perfect condition, with a sharp blade, it adds the of currently facts to be either had been made and filled up with tangenal .1

Lege Bound, Face Painted Red

The next fest ire, encountered at a depth of pine feet, was a coffer of tiel canes cona ning the extended skeleton of a powerfully but, missie-aged man whose holy was es appoint that the contract of the state of glach. A strong to star the war the first

" till to by literally by the and talman and the a Marcon of Marine in Edward State of the Samuel State of the September, 1941, September, 1940, Accust, 1939.



for ed and Round the Western Head Machiners Chose the Enc.

the state of the state of the control of the contro

the selection of the second of

Over and under his face were knowls. In his or it was a relate more of coppers. Red pagment had been placed on the torches and books and a land compared a registrer and books filled with carn or beens and note containing rotton books. His came of the case of

Since un identical two to the time pot was tested outside the content, just below the head of the grave, it is probable that a tember of the theat by puts per tained to the tied man's burial offerings. However, the electing and two well as buried to a doubt we had that we had the a doubt Chapter the adverted that we had the doubt the

II so in novinas "I if the tied man's coihn fested upon a much larger and more ruch exite burial. From here on, for an entire day, rom dawn to dusk, Exams and I did most of the diggling as well. as all the photograph-· g and recording while मान्य स्थापित स्थापित । श्रेल्सी with mild interest or slept in the warm sun, It was a lidey and exciting finale.

When the uppermost color had been for a recorded and temoved, at was then possible o work with the lineer and more etal orate care sare plugus below, upon and around which were other offerings and hurials.

The major tomb ware about 9 feet long, 3, feet wide and 2 major bigh. It was composed of heavy cames reinforced at footh and

lara was a strat for the order of the lid and see what it contained, but much requiring had to be done first.

On the total the party server the party of the party of the total and were the contract of the total with party at a will be total with party and the will be total with the first and t

probably I danged to the upper burial. Another sacrifical dama lay to the right of the foot of the income approphagus."

Signs of Human Sacrifice

However, the most starting evidence of sacrifice were the distorted skeletons of two in title-aged women. One of them, with associated offerings of pottery, was crowded in at the flot of the main tomb outside the large cane box. The other lay to the right and near the head of the sarcophagus (page 456).

This last body had been craning in between the large came touch and an ancient adobe notice will of Gallinger times which had been encountered at this level by the Mochica grave diggers. The torsion of this skeleton was even more extreme than the tof the bunilled female skeleton at the boot of the grave.

Considering the general practice of the Moschula to extend the looker of their dead, it is hard to see the ride of these two women so therether than that of sacrificial victums who, a force of otherwise, had accompanied the river old and great prost-god into the afterworld. This may be speculation, but, in the light of farther evidence baside the sareophagus, it seems the most reasonable deduction. There was more than chance in this association.

It was no in by the time we had, by a corded the story to this point and on pit, say burning curiosity to see what the main sar-cophagus contained, we stopped for land. Evens him has were able to extend from a sale of the touch to the other and would on, but I knew my a other ones were aching and wears

The writement were used to our slow and apparently interminable approach to burials which they had uncovered for is, but this was not frue of the only other witness of our resurrection of the Mochan gord in apace. This worthy, attached to a near-by be not was an amount range role on a feet tone gray botse. For four months he had desponded from sanity as he came upon as time and again while we were distributed through refuse that while we were distributed through refuse that after refuse heap and gloating over pieces of broken pots.

All the time the cynical one had been consinced that really what we must be looking for was treasure. This time he bad cought us flut-footed in what might will be a right torol and, absurded upon absuraity, what did we do when at last we had the sprog hagus bare of earth but stall covered from the human eye? We sat down and are limit!

*See 'Came, of the Clus ' W. L. Lodza, National General Moss. M. S.



Offerings Included a Sacrdiced Boy

In einter at left are the ribs of the lad Laried with the great man, Just no a loop accompanies the dellate once to the carving near the top of sie I. It wasn't a long lanch. Archeologists are human beings, too, Wathin half an hour, thank was down in the pit, carefully removing the thath and well-lashed care cover of the main sarcisphagus. As he lifted the cover it was impediately apparent that here, in the upper section of the main apparent, were the rich offerings to the most important person in this complex tomb.

I had just time to grab the range rider by his belt and hold him out of the grave, for his impatience had gone beyond bounds. He

was thanking of gold and treasure.

Even a quick glance at this strange occurblage of offerings showed that there were treasures here, but they were get treasures, not gold or silver.

Ohe's first glance lingered on namerous palated and modeled Mochica puts and on brightly volored green, yellow, and The feather headdresses. But the eye some stopped on something rise—two great curved algarrobs wood batons and a lighting mace that extended the length of the tomb, their etch-omately carved heads resting above the breast of their former owner (page 479).

We have spoken of the Moshica as artists in pottery, but here were suddenly revealed he buest examples of wood carving yet found

'n any Mochlea sae

key to Tomb Is Long-langed God

It took several hours of clearing and recording before we were able to remove these tures important objects, one of which, particularly, furnishes the key to the arrangement of the entire tornb.

The most cloquent reremonial object is the osfoot copper-shot digging stick with the figure of the god Ai space on the top. The solid shaft of this remarkable specimen is surmaunted by an beinch figure of the tusked god himself, with the entire body begintfully carved in the round and intakt with bright-cob red shells set in aspiralt (Plates I and III and page 481).

In his hands the minint are god holds a jaguar-headed digging stack with which he is making furrows in the genued. The pupils of his eyes gleant red with white irises and his great fangs of white shell plisten. On his head is a crouched jaguar forming part of a crescentic headdress with a large indented knob behine).

Down the middle of his back extend the bend and neck of a serpent, forming the tar of the jaguar headdress, and from the god's waisthard Iwa other serpents extend to the ground to form his forked tall.

The sespent, in many times and places.

bus been symbolic of fertility and life-giving water. That is probably the case here, for on the right han I side of the god stands a little boy who, from a broken basket at his side, is throwing trequoise, the symbolic corn seeds, into the furrows made by the diegine stick of the god.

Here is the prest agricultural god-moler opening the planting season for his irrigating and agricultural people. In the same manner, many years later, the sacred Inca in Cusco performed the first planting of the highland

maide thon.

Likewise, very close parallels exist among much earlier Old World empires where the carefully controlled life-giving waters were also basic to the very existence of the people. The pharmals of Egypt and the arclept emperors of China, who performed almost identical tites, are striking examples of similar conditions leading to similar ceremones.

Thus the attributes suggested by this first carving would seem to in licate that its owner was a priest, or even a god, of agriculture

The second long ceremonial digging stack, which long ago had bed its copper chisel point is far less flamboyant than the first, but it has a special dignity. It is summounted by the tigure of an owl curved in the remi, with deep stroit designs on the shaft be own

This owl figure represents the very familiar technics, or furrowing (w) of the Peruvian desert. One associates this staff with wise countil and, perhaps, with one of the actual feathered beaddresses from the timb, since this bit of headgear hears two artificial birds which peried over the weaver's forehead.

The owl boton, then, suggests that a second attribute of the old priest whom the late Modica buried here may have been that of

committee,

War Mare Bears a Battle Scene

However, it was the buttered war more which immediately caught my eye. This is a math-used, beautifully carved, and very deadly weapon. It is balanced like a rapier, or a perfect baymout if such ever existed, and is made for fighting eliber with point or butt. It has been battered around the upper end in battle, and the convening caghe, or falcon, with spread wings is broken.

Nevertheless, the entircling design showing two large Mouhica warriors puesaing three smaller, possibly Gallianno culture, warriors is clear. So are the humaningbirds participating in this spirited action, the council of chiefs below; and, around the neck of the club head, the three lashed-up dead warriors staring at

the sky (page 478).



Symbols of Larrich Cities Lie above the Body of the Fighting Prest

The spine service which has the company of the light of the major that and the distribution of the distribution of the first terms of the light command who had led the boot Machina and the light command who had led the boot Machina and the light command who had led the boot Machina and the light command who had led the boot Machina and the light command who had led the boot Machina and the light command who had led the boot Machina and the light command who had led the boot Machina and the light command who had led the boot Machina and the light command who had led the boot Machina and led the light command who had led the light

if the note with a large reld man who was buried in the state of a printer translation in the acceptance in the state brackets.

the we have to the case sarcophage with interest to the case sarcophage with interest to the Willy or service the third one is a server to the training the case to the training the case to the training the case to the training to the training the case to the training the training to the training the training to the training training to the training training to the training trai

to stary the effect on the wooden copperupped dugging stack, sact a constaste was bard trescape

First, over the old man's boy which have felow another layer of hound can at were made tended the two great whosen stayes and the futtle mase which had more at itsuted by outhority as an agricultural and a connection and a veterum war knoter

Second by his right wife exactly and the apare made, and with he of serious and was extended the actual act

479). Further, there was a mass of tmy tur-

quote brads by the old man's neck.

Collapsed beside the head of the warrior-priest-god were the remains of a headdress, originally very similar to the one work by the effigy of Ai apaec. Time ar I the crushed condition of this corner of the sarrophagus had looken it, but here were the remains of a faser, cotton, and feather headdress frame with three metal pass of grided copper and two grided copper covers with dangless for an animal's jaw, all of which had once formed the tusked animal on the front of this claherate boardress.

Finally, we found here an arclent animal's jaw which had the actual great overlapping capite texth that archeologists know so well from carelogs in the unclear cultures of Peru, Colombia, Honduras, and Mexico (page 481).

This peculiar animal jaw was an old specimen, like so many preces in the tomb. It was mended with thread and asphalt, but there is no doubt as to its authoritisty. Zoologists at the American Museum of Natural History say it is the jaw of a dog for (Doubt now endports), a creature about the size of a large coyote, which is still extant in the highlands of Ecuador and Peru.

Captives Throws into the Seg

In addition to all these factors suggesting an identity between the god concept and the dear man, other contents of the total furthered this related to

There were 16 pattery vessels in the sarcaplingue, all of late Mothica white, red, and black type. Of these, three show the good Mapace. On one be is leaning over the moontalus and fishing in the sea where he has caught a shark. The little dog with the long teeth, so often associated with Al apace, is lustily swimming after the big shark

A second put shows Al apare taking what appare to be a fish away from some manlike demon, and the third shows him sitting on his throne at the base of the mountains while prisoners of war are being thrown from the mountain peaks into the sea. This, too, is a common theme, and here Ai apare has a lizard

for a computation or secount.

The other pats in the grave are highly varied: a skull pat (apparently hastity made for the occasion); a weird potato-face put with thatly eyes and a made-up plak month, a form paper? with a hardle: several portrait vessels showing claborately costumed men; and one vessel with a valid hunting scene, with the broaters throwing their spears from spear throwers and the struck deer stretching his head back to lick the woung.

Very fragmentary remains of a third head-

dress were found, besides the jacous and birdhead examples, but the leatherwork was in poor condition. The trop cal kird feathers in various plumes and facts probably came from the eastern side of the Andrs.

At Last, Old Al apage Himself

It was late in the day, the shadows were drifting arross the face of the Andes at our backs, and down in the grave shaft it was cold when, niter recording and recoving the offerings, we caised the last carefully lashed layer of cases and limitly saw the body of the man who impersonated Ai appear

The body was lying fully extended with it had a some from the age as an entity tag, with fine but badly decayed cloth under this covering. The bases face was hidden by a simple copper mask, below which was a remarkable mouth mask of copper with cilding on the outer surface. This had ociginally fitted, one must imagine painfully, over the septum of the case, with the two conventional hinds' heads tharing out on the sides, while the circular stone center, with its turquoise border, rested over the mouth.

Such mouth masks are very rare and are believed to be the symbol of a god. They probably have some relationship to the felice certy, since they occur on not gods in the color-

ful Nazes potters to the south.

The skull itself was hadly broken, but, thanks to the preservative quality of the copper mask, the lower law was intact. It was the jaw of an old, old man, so old that put one to di was left. Even the sockets of all but two teeth had been absorbed.

When we uncovered the landy we received another surprise. Under the layers of mutting and glath the extended body was covered with bleathed white skin. Apparently he was so and that the skin had dried like brittle parchiment. The old man's knees and his ankles were field tigether with gloth sashes—he and the "field man," had been treated his the same (ashion

The entire body lay on a black mass of the tang cotton, and behind the warrier-pressenced's head was a great pi low or infented button of cotton, like that his nd the headdress on the carring of to apaer (Plate I). Below the thor of the care sarcophagus was the refuse of the older Gallingso culture,

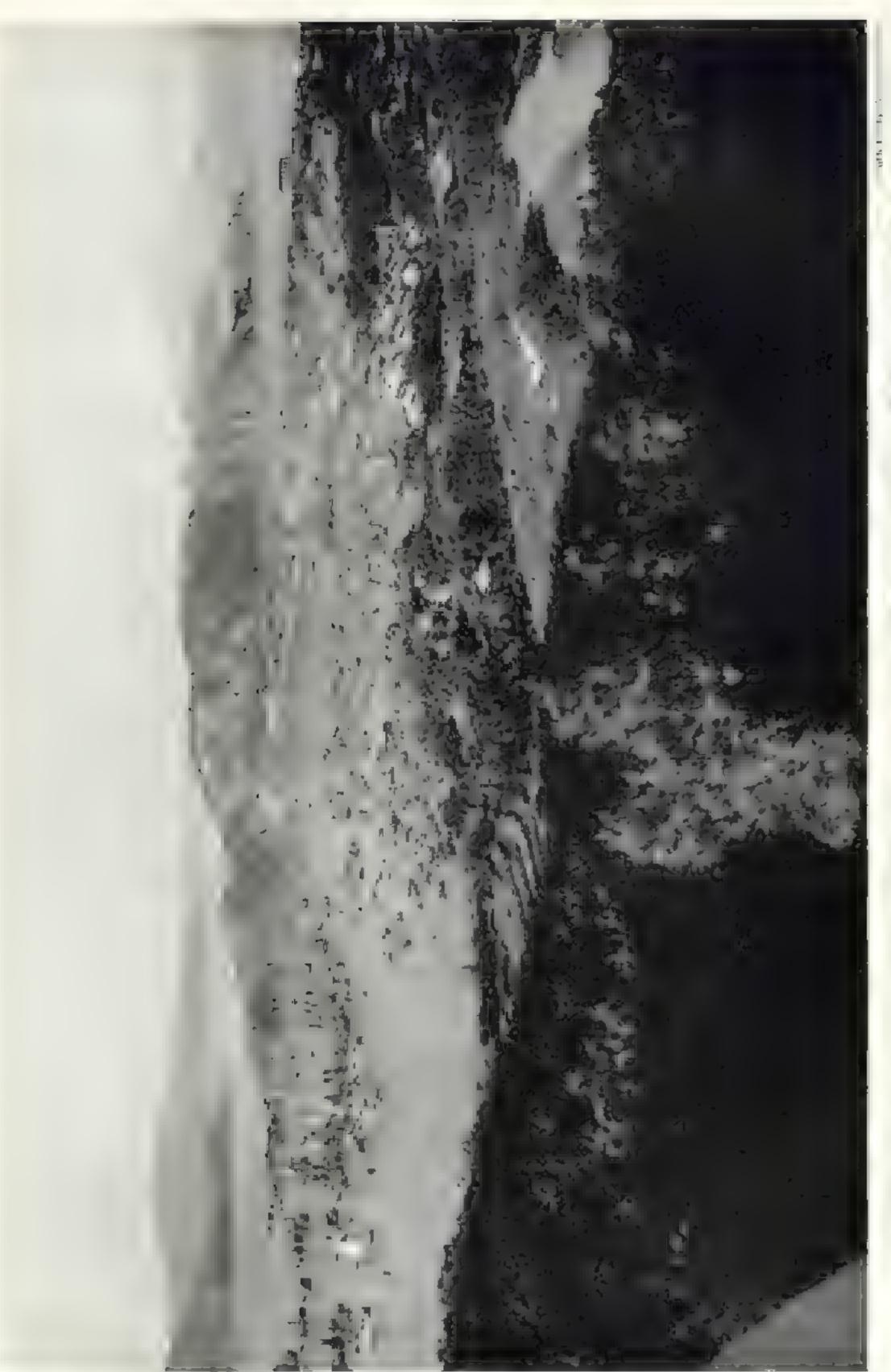
When we tried to remove the Lones they cruntiled to powder, for this was an old, old man who had died and been buried with all the honors of a god a thousand years ago. But before he found his destiny of dust to dost, he had given us a privates glampee into the life of the past.

Hong Kong Restored



A Bearded Lion, Three Men High, Stales a Hong Ken, Haliday Crowd

I lead to the term of the state of the state



"Dumbhell Island" Ciching Boars Jam the Natural Har Enles on so order of the form the second or the second sec



eads the Sign on This Sidewalk Lending Living in House king "One Cent for



through their laper we letters made, a Hung Kong Cahelal Greets His Laberar or Very Land Community of the Co



British Salars Distribute Food after the Japanese Laid Down Their Arms

A a company to the company of the compa

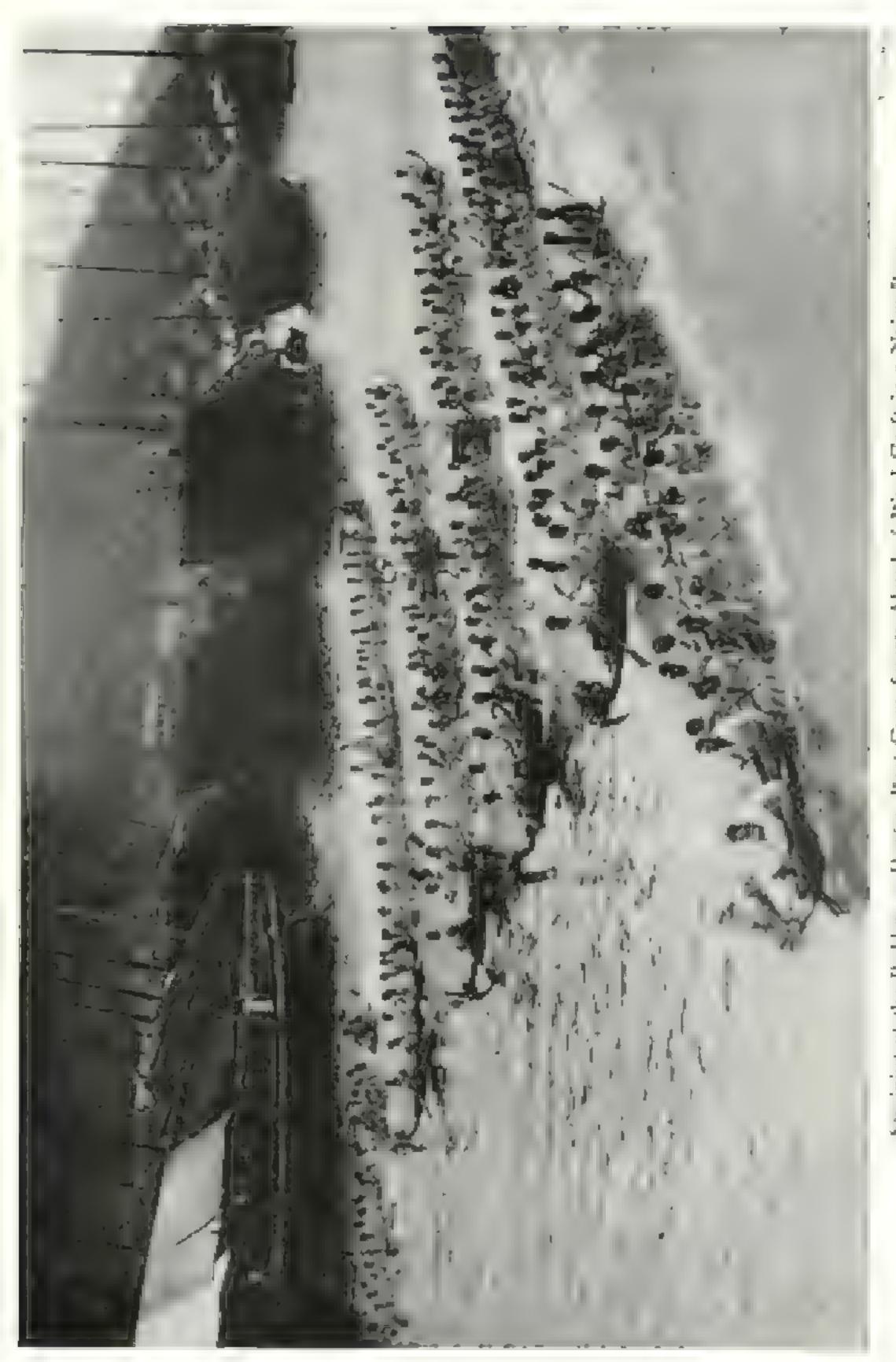


The Lang and Short of It a Charese Boy John a British Sertry on Par. A

the least the state of the stat



A Bearbard of Chicadon Jackstone Heads for Shore to



Straining of the Paddles, a th Assorbants the box the second to be been



Firety Feet of Pircer teless Stup and Spotter in a New Year's Creeting

A grid to a section of the training of the section of the section

Backwoods Japan During American Occupation

By M. A. HUBERMAN

NO BUILD their wood and paper houses; to cresk their food and to keep themselves warm over their braziers; to ensure water for freigating the varley rice fields; to be a the mountain slopes from sliding down over the food-producing luring to make the boats for bringing in the fish; to supply the sleepers for rathroad tracks and poles for their telephone, telegraph, and power lines—for all these necessities the Japanese depend amazinply on their forests. The forests cover 60 to 65 percent of the country.

Khawleg this, General MacArthur and his staŭ in October, 1945, established a Forestry. Darision to advise them on forest resources

and forest products.

First, we had to determine the location, the e or to present a text or re-.. ir es. We had to find out hew much was being produced of each kind of product and how to get the Japa to promuce more.

This survey gave us a chance to trave through the backwoods of Japan (map, page 897 . We saw locaing operations, sawnulls, veneer plants, pulp and paper milis, charcoal

lains, and campion stills.

Through our Nisel Interpreture (page 516). we spoke to sowmill owners and Liberters, lumberjacks, log rafters, charcoal burners,

farmers, fishermen, and shapkeepers.

We met governors, mayors, thiefs of police, village headmen, presidents of forestr operatives and community forms, and officials of Government-monepuly control associations and control companies.

We flew and rode in courier planes, trains, jecps, trucks, horousines, jugicants, fishing vessels, bateaus, and longing cars, and walked to remote valleys and towns in Interior Japan.

When we rode as a prefectural governor's long, black limousine, driven by a Japanese changieur, the physical comfort of the deep cushions was often more than offset by our

mental discombatt

The chattife of section to use only from and accelerator. He seldom applied the brake, · thaps because it would have meant taking as foot off his beloved necelerator. I doubt that he ever needed to have I is leakes relined.

The pedestrians in the vidage streets budto jump out of his way. Many times the

 The staff of this Department consisted of three civilian. sment be consultants, detailed from the L'S borest Service and less perfor officers and ephyled men who with forcedly graduates before entering the Army Later three Australian foresters, others in the Austrabut Army, becatte part of the Gall,

crowds would part before him, as the waters of the Red Sea mast have parted for the Hebrews fleeing from Pharach.

It was nerve-wracking to see how narrowly he often missed hitting children absorbed in

playing in the road.

We finally had to tell him, through mu-Nise, setgeatti, to slow down. Accustomed to criving for the governor, he found it difficult to comprehend our concern for the people in the streets. Traffic mayes of the left m Japans, so that our car always seemed, to usto be in the wrong lane. We never hit anyone, but I can't understand why.

In travelage away from the densely populated, heavily bomb-damaged renters such as The Arteria, Osaler and News (1987) plways was the denger of forcetting that the people we saw in the villages and in the hills were also warmaking Japa. We had to remine refraction that the process of the contract men and munitions plant workers were recrusted from these rural families, who were so hospitable and courterus. Their manner second somewhat less tractures than that of the Tokyo Government officials,

Factory Owners in "Full Bress"

Owners of sewmills and small wood-produris plants which turned out geta, or wooden al as a multiple baseling god and historia STREETH SALL IN CONTRACTOR AND RESIDENCE OF A us through their establishments. Almost always they greeted us in their best clothes. not infrequently with wing collars. One owner wore a sugar-scorp coal, striped fromsets, and white piping on his ve-t.

No plant visit was complete without at least one cup of sugarless tea in a handleless cup.

After such a tea party the host, with much buwing, would reption us to lead the way, and after him would follow his assistants, in order of mak. He would proudly point out pieces at the state of the training and particular training chines, and especially the electric motor as he recited the horsepower and production figures of his plant.

Over 80 percent of the 7,500 sawmills in operable condition after the reseation of hostilities were electrically operated. In contrast to their prists in describing the physical aspects of their plants, most awners were refuctant to give information about costs, prices,

and wages.

Much cross-questioning was necessary to olitain such data, and often we had to ask the same question of foremen and individual work-



In June, Rive-transplanting Time, Bucks Are Rarely Straight, Feet Seldom Dry

I plant a sown like wheat, myoke on a many ly dile labor, but owland rice keeps everyone, from prandictibes to . In the more table in multiplistic work and applying fertilizer. Every task proceeds by ration and a manufacture of the parameter of the process of the pr Bury zrow. Lit. or all the state of the form theories to things 495, 506, 507, 509,

men, after having one of our party lead the owner to grather part of the plant.

Such separate questioning almost invariable.

produced divergent . 2-3-55

With regard to wages this was not at all surorising, because, in a klitich to base pay, Japahase employers provided certain perquisites sub as food and clothing rations; and for implicate the picture further, they often give to their most oberient employees a year-and to tius which might equal or exceed the en ire annual base p. jr.

A time-consuming habit of the Japanese renunded us of a tailly consideral even

would direct a question to the owner of the plant or heal government official.

Our Niser sergeant would repeat the question in Japanese to the 'number one' man, Not knowing the answer, he in turn would repeat the question to his first assistant. When this man did not know the answer, he would repeat the guestion to the next man down the ine, and this continued until one of the underings in the parade replied

If hone knew the answer, one would be referred to dash off to the office of some other place to bring back the information. The asswer, if brought in, could not, of course, be



Something New in Japan: Fluorescent Light Leves Insects to a Ke asene Trup

(there, to percent the forces, he explained by the terms of the most mode of the foods of the fo

eiten direct to the rumber-one man, It all the day the control of minds of the last trickled down to have the manufactured the asswer to our interruber who translated the control of the

the except to the figure by local man in the comment of the last belong than in the comment of the last belong than in the comment with record to the last be considered we noted and would be to the man that the question when a set of the mannion of the mannion of the mannion of the mannion.

sont flaws the ladder. Sometimes the possess would be on a last total that it is the transfer to top, especially if policy was involved

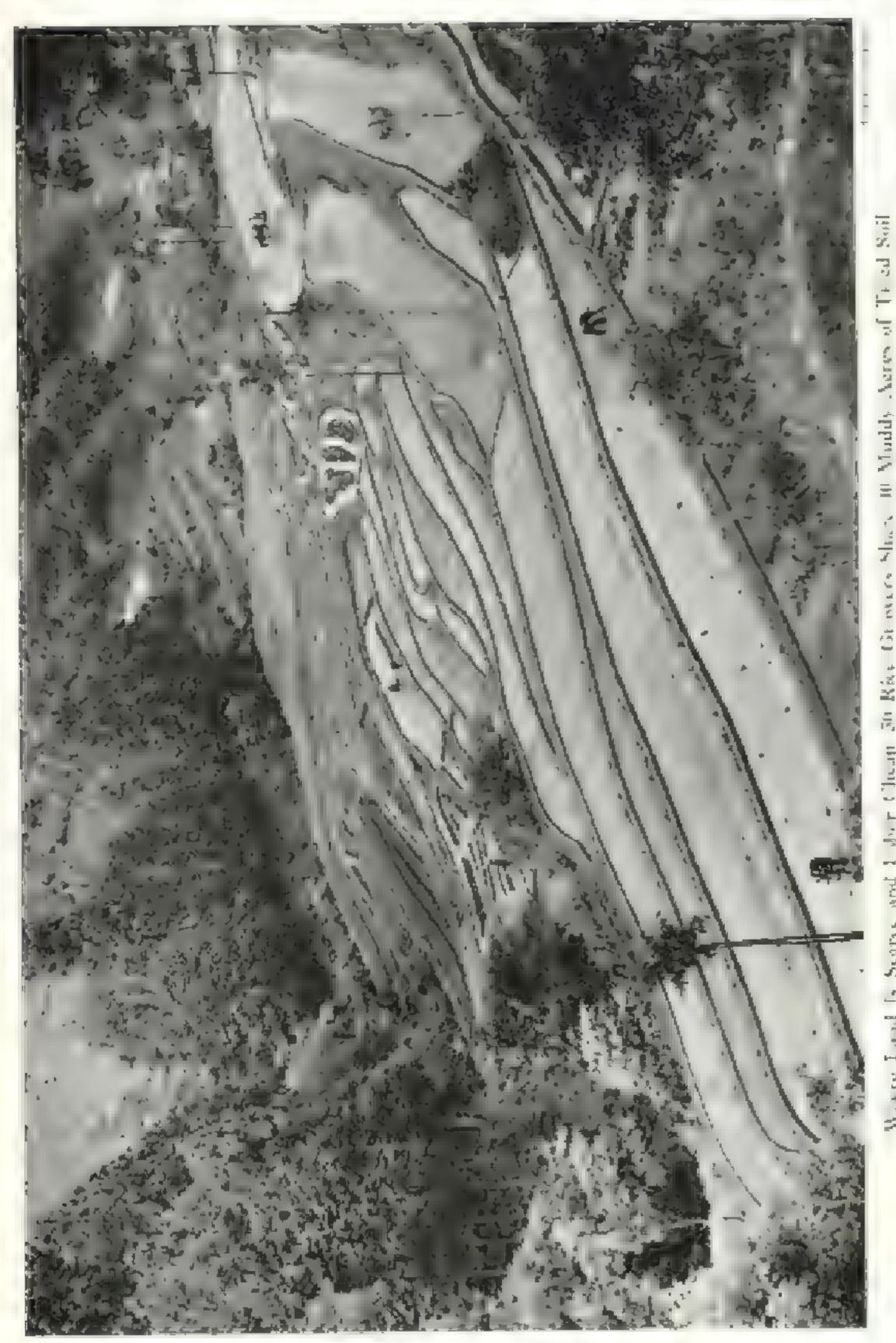
in and, the heart property was an endount not only the official and only the official an

The later we had to this that the Ning segment hence the dust to the control of the other. I have exact the control of the other. I have exact the templayee had

Michael the surface we sought would be the letter we pointed out visit



(duly 11





Become after But ket, Saltmeners Tediously Se top the Sea onto Their Stimbles.
On the character for what Is and, pumps are as searce as soil man, but inform as a abundant as organized to be to be to be a sea of the state of the Constraint of the

there is the property of the fewer inconsistencies in their replies

contact with very restricted particles and the same of well-as and ended to the properties of the same of the same

or the Many Personally the water

there for only phout two months,

Poeh-Bahs of the Villages

The cultare the mapped of the engine of the

with the problems aifecting the welfare of the people.

Mayors and village headmen, on the other hand, were usually local men and as a rule were well, informed about the problems of their commutaties.

Often they took an active part in the ecocomic hig of the town or village. In some instances such individuals had a virtual numopoly of the husbness activity in their hallwicks.

We were comically remindos of Gilbert an l Sullivan's The Mikado. by one mayor who was president of the local lerestry association, which owned or controlled a large share of the timbered prountain slopes in the vicinity. He was also president of the local lumber company, which was the war created Govermment monopoly controlling the sawmists producing the homber.

As mayor, he desided that lamber was needed for repair and reconstruction. As president of the association, he decided to have some trees at and to sell the logs to himself as presi-

dent of the local lamber company. In this capacity he determined which of his sawmals should cut the Les into lumber and which consumers should purchase the finished heards.

The fees to be received for each service were set at a conference between the mayor, the president of the forcetry association, and the president of the local it when company. He laughingly explained that he thought this was a most emission arrangement because there was seldom any difference of opinion at such conferences.

In each small village the third of police, in black uniform with gold battons and small sword as his badge of authority, booked and acted, almost without exception, like an imi-



Four Main Islands Are All That Is Left of Japan's Empire

M at people think at delibouse Japan, nome of 30 millions, as cultivated nown to the very last tuch. Actually, intests cover till to 65 percent of the avoidity. For help take a campa of the Empire's fatest resources for General MarAribur, the author to rest the little-known "backwoods."

intion of a Holly wood version of a Jap. He answered not to the headman but to the Ministry for Home Affairs through the prefectural governor. Everything that happened in the vidage seemed to be his concern.

It appeared to be impossible to held a conference in a vilinge without the presence of the chief of police or one of his representatives.

The relactance on the part of minus officials and ordinary people to provide us with information in the presence of these policemen was almost unbelievable.

Fish and Suit Towns

In several seasonst values set on buys or inlets where forested slopes came down to the



By Their Saws You May Tell York and Junior

Now and cum to the couple of the late the couple of the late the couple of the late ark and to be forth as the complete of the com to the state of th Let the desired as the Markette and the I was a series

COUNTRY LATER THE SECTION OF THE RESIDENCE bonts come in, each propelled by an natsman IT The work to be as in the first the state of the state of with a rolling motion.

then many them the companies the working for with their babies on their backs would come shown to the beach to so what hick die r Letter a hard here has a more they could age in the sale of the last on the sapel, they I from the stand of the first of the contract at the cuttleter year reader, e.g. brems or proceeds to be the master of a state of the transfer of the tr part of their for the pay (p. ac. 4)

In many places armps of fishing boats

worked fish nets to gether. When they breught in he se the familia of Compa ermon walle, le 1 1 1 1 2 1 1 1 1 1 1 the to wre train to end a uturbasi status beef for the punt o sance decof late 1 train to a mile ize the shares

In want villages fish were dried but later use. by stringing them up live Fish are an the others source a present in the Japan-D22 - 11

Furnity of Salamakest

Many of these . wattini ka sit The valueakers eval rate the sea water in I'd toys in the sun or IN JULY 18 | , to SVET Wind has a small it: iw shelters (pr 1 in part 4te t

En one die stras butines about Karan a salt a ner crirer. by the smoke from the wised fire under the es if maining pan, explained how he hi . : vegr-ni | sen, and hi wife, with a besamdge. le I for her back, must-

they are bolger of mer I water up the heach to the o-inch.

They chepped down the pine trees on the bilk. The from the bulk to the some the beautiful

With a wooder too for they obserted the salt into a wover-grass inverted cone innact in, ing from an upper tipule and term of I excess water and dry the sair. The they placed the dried curty god sail who were straw bags for delevely to the exemplant main all set off to 112

to a lister and most benefit and to take il self minus in the United, Mates, and were even more impressed with a brown-pape

park to pare white the training to the first the training to the training training to the training training to the training train

One day, while walkno through some and
we tall offer we came
upon a clar off his article
and his wife about
hard finished alling the
straw tales with newly
upale charges.

The kiln was already

or with another

to be of charcoal

the than and his was

broked low as our from

nese orester go its ex
plained that we were

k resters from two our

trackethur's tand

quarters

Paring Canned Benns with Chepsticks

The true seemed to a wife wite his wife, and she disappeared into a west treted wheeler a house

with a me suppeared with a me suppeared with a me suppeared with a distribution of the contract of the contract of the mean had in the meantime accanned be real blocks of wood for up to all on.

opt the tea for us, we track out our C and K rathers and offered some

C's to the couple. The woman starle of a looked at her husband, who told her to go into the house again. He would not accept the ritems of a calle told him to do so

All out it was not easy to identify the former in the factor about the entire med to be no doubt about the entire next the fee felt at using his freshly out thosesticks on a can of beans and sausage.

The control has bown he and his wife of the control other hardwood trees on the long protection is the trunks of the long to be a long to the trunks of the long to the long t



Tin Clay on a Stick Laulet a Brine Sample

By evaporating sea was a posterior Japan produced a third of it is not property by the state of the state of

I pool (our ext his cave to terch to the later of the case of the place) and that he can the ees so that they we have sprout from the containing soums and in few to six years provide another cut for characters.

Bules of Charcoal Carried on Bucks

He and his wife carried the bales of charo al or their backs to the logging station of the national freet some three or four miles away, and at such times saw other person

We asked what he would a when children would be big enough to got the could like answered that he did not know



L'EX 1111



Rabber-shad Brancour Lie a Rata with Grass Kapes.
Loss all a transmission to the trans



Rolletstanster Uniderjack Cambling with Death, Stears Logs John a Gressed Trestle

A 5 - 1 | 1 | 20 | death of the log beautiful to the document of the log section of the log section.



M. A. of Physics 2.

Intropen Crops. Imprecented firmers Bart Charcoal to fit, Out a Living

for the stine houses and all an age of the most entrance to fine and a following and proper the first the contract the first the promite that the first the f or relied Legal ration will well sear or a tell the cold becomes a figure or pro-Trimped helds surround the kiln holds: I had (page 4)4.

He changed the subject by pointing to rowe of facti stumps (page 500) thetween which he and his wife had plainer, wheat and sign sectlines. He said that after cutting of mature sign in was tross ble to harvest three or four ope of wheat before the newly planted seedlines shaded the ground

A on the hank of the G keep River in cenal Kaashu we saw women making halls of tours and chargoal particles which were too the to transport in straw lades and to burn in domestic beariers. Soul, charcant balls are much in demand for restaurants and prisha dimin-89

We visited lumberjacks in Kvasha, and in Nagami, Akita, and Aomeri Prefectures in Houshu. In some permanent logging stations on the national forests the lumberia ky lived with their families in small to k-roofed woodand-puper limites,

These were suplar to the Trotta -- I

which we staved name tings. The area or walls were stiding panels which were moved. aside in the morning on clear days to reveal a narrow passageway on at least two siles and sometimes all four sides of the bouse

Houses with Convertible Rooms

The inner wall of this passageway consisted of slicting Litticework wooden pane with the openings in the intrice covered with transliteert handninde paper.

Inside these lattired walls were the moms, which extended the width of the house from passageway to passageway. The punels becween rooms could be pushed back at removed to chambre two or three mores into one

Usually the room at one end of the house opened into the kitchen, which was often in

* Jugan Criller, or Craftman and resembles California to be seed but in mit we



1 S Interseers Ger a Careus Thrill Ruding Hand-broked Langling Care down a Mr susum

to the kent of the root of the root to be a cars by omer and the cars by omer and the cars by other cars b

leme to with an earthen floor. The room at the opposite of all the boase had a non-sliding wal, and the tokenomy, it into acrove, where it is a large of pasited tranks of the color of the ever-present flower arrangement of spries of foliage or flowers, with a backdrop of a kakemona a long, painted silk or paper of the color of t

No state with howards a meant has the host three distributions panels.

For a start of a new start the limit of the was almost places one clertaingly in the room with the

the floors were conced with wasen straw, onto three feet by so, feet, fixed together to our a square. There was no furnit re in land on a semilar of the reason of next densely or next densely wooden belogistic, or charge out between

the rate of the there are in trays or in the floor. The soft shelves held these quits during the div

Off one corner of the kitchen was the luth.

the kir hen was an red in wooden palls by the written of the house.

ingly hot boths, we found it a roully relaxing pleasure to bathe before supper each night after a terms day in the hills.

Fire Huzurd in Bornsche.

The unmarried has berjacks or those with the number of the legactors with the report of consisted of a long, low shingled or back-out was a scalar to a long to still feet wide and 50 feet long.

As with many buildings in the mountain to ateas and in the northern part of Japan, heavy stones were places, on the tool to prevent the shingles or sheets of back from being blown away

The bushing had two rooms. Carryll, a carthen dorred kitchen, and the other was a way neither of carryll and the other was a market room with a dissorter to be bottomed pit to come of the carryll.

In this pit wood or a climes charen a value and for deving chart. I. .



A Stall in the Kyushu Backwoods Cooks, Not Sour Corn Mash, but Fragrant Complete Notes and Jopan connected the campber mirror. In their address columnia column, American pullhaple as \$5.73 a pound for complete Starber. In the real new planters broke prices, Japan's lot of leading complian producer, have all we the finite earnphorwood chips. When the contrain the chips become by an

rufters and walls were grimy with sold in 1 - 1 - 1 - 1 - 1 - 1

The more slept side by sine on their is with the state of hearing pit. Thiring the day the quilts were rived outdoors or stored on shelves in a ter a room the different to the THE COURSE OF THE PROPERTY OF a mystery.

Is to prove a Japan to a Roberton swood-bittuing stoves have been substituted for ere open pit.

Rolling Logs down the Meantain

The lumberjacks we saw in the Kara lonreal to No. 20 | 10 pm | 10 m. shuk, were husky, ruler also king fellows who and I begin becomes, some a sit Hokkatklin

In March, which I show was no not three test leep and the weather last all we to conthere men from the north were found to be more sat the than local laborer for the ham work of getting out the logs which had been out in late fall and early winter.

They brought them shown the mountains in variety si as an the Kiso. The most specto the unit of was that of leading two or Plan on . . . v is their 15- to 25-but but payed or the while represent the rewith the english the late of the shall MI ALL PHERMA

I we furniberjacks would start this any sled 1 112-11 2-21 1-54 55 1 159 1 150 1 111 red and only in the tool is eached rifer in Lake Hacid bule-led, down a steep, winding saw fill a coerrig new is 1 for the b banked turn in the trail. He steered by applying pressure with his feet on the skis-

To slow down the sted, he held a light to the best to a direct which the this ; all hank timbre to a gent a key has been be to all weed down in the part of the area of all the log deck at the foot of the conditioning all in front of the sled and making his fort in the snow and his back against the log .

A sit mismak ulation could have resulted to he work run over he his look, but this dat per highest very often, according to the first **AUPERVISOR**

Another method was a series of log deflectors in a cities arrange in a fown the about.

When the snow was such chadgle, the



Islectric Motor, Vanity of a Rural Household, Threshes the Rice Crop.

Meaning all Japaneses a services of the first trade to the Hockwood of the form of the contract trade of the first trade of t

is exjacks started the loss down the steep open toward the first deflection it from sed them off at an angle so that they beaded down to the next deflector, and so on down the mouthtain to the log deck, where they were loaded to the se.

There is a case were brought to the meantage or a case wereas, all as he can high the best est for our are saturate terminal up and down the slopes. The empty carwere harded up to a charron harmon, how he produce to be cars were, they down he produce to a correct or with hunder as he are to be a ced by sand to a combine as he with the cars make their way down are a d hairping turns without jumping the track (page 504).

Less claky was the use of steams or Dieselpowered donkey engines with winches and
the und high-limes copied from some of our
law Mauritain and W-1 that care
shows by visiting Japanese logging er some an
inverse especially proud in showing 1s an
inverse with a Wankesba Wisconstructure
plant to war.

Branch A I I die in the barrant

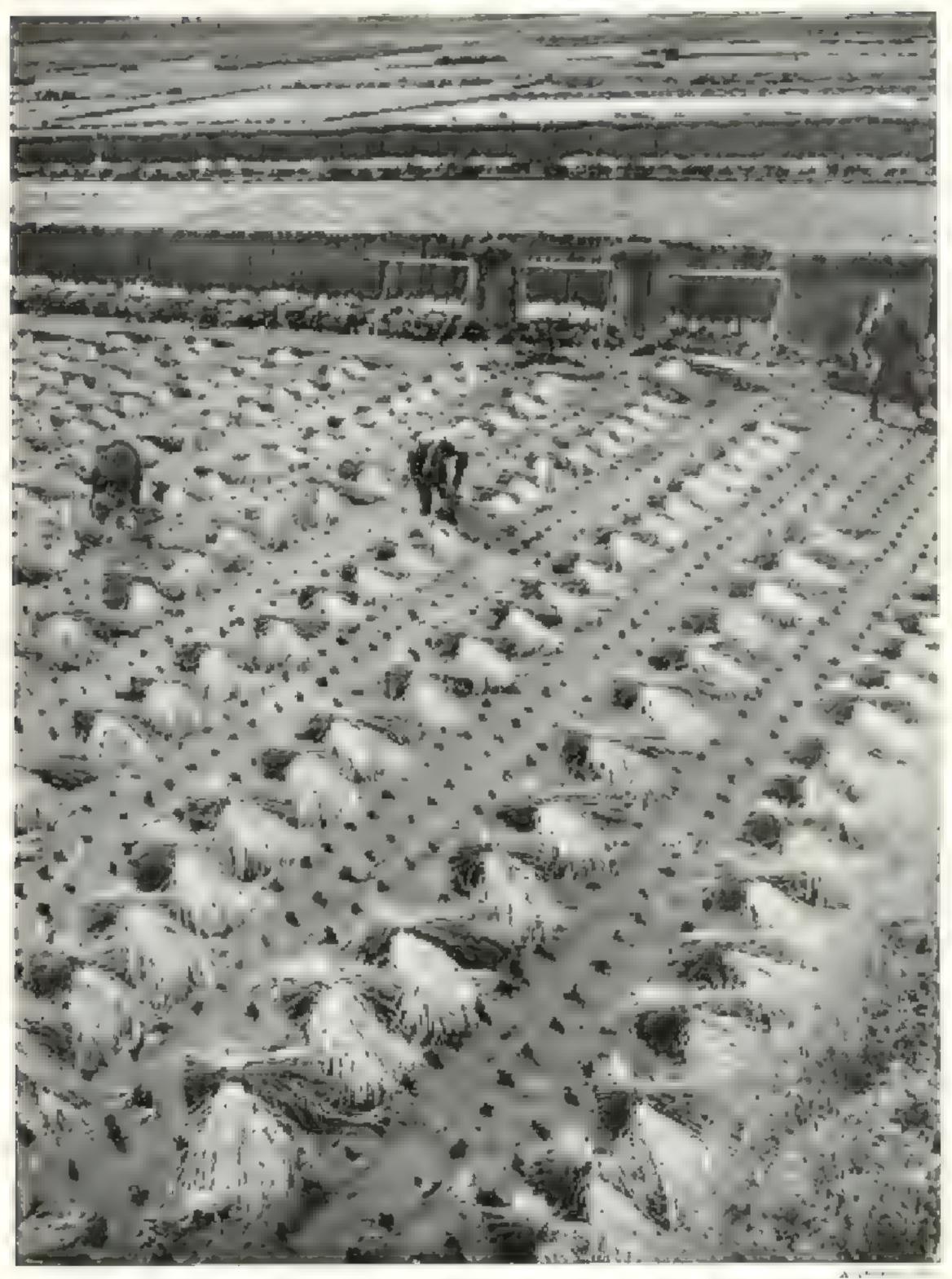
by the placed on the logs, from one to three to a load, suspended on a calde, are by trolley ridden down the sky-line to the but deck at the clonkey engine, where they were then loaded or the corre

In the absence of snow, as in Kyashu and in southern Florebu, as well as in spring and should be begind in northern Horshu, must decid by of logs was role by nearly well worken sleds pulled by men or a source of tracks, were not constitute placed in data tracks, were not some a method (page 502). Owen were used in Kyashu and horses in Hokkaida to kei bus.

Logs Peeled for Bark

In many places logs were peeled in the woods, the hymnelian sized Cryptomeria, to obtain book for rothing or for walls. We are then being pushed down steep thate the residence waveness aw run the steep that you we the slippery tranks addeasily over one ap their coace for the hands or machinery were less hand and their machinery were less hand and their machinery were less their coace.

Altrata, as some offen worker along or the men in the woods, they were more commonly seen in the log yards, where the logs were accumulated before being transported to the



On a Desired Puddy October's Golden Rice Lies Pewered in Double Shewes

The completed tests with a first and the first tests of the control of the contro



No Volegno Can Bluff the Wilman Who Hees Her Chop 50 Feet from Steaming Lava in a print dead, dealing atthquakes, typical indicator and parties in least the long. No. and have made in a subject to the contract to be parties as from I have sufficient envelope.

warrangs sammed as the take or the

The mountain coarly leading back into these logging operations were really something to write home about. We role up such a narrow, tortunus, all ppery road one cold, wet the

Our driver was no unsoriting Jap who seemed name interested in looking at the misty was treated in looking at the misty was tassely hugging the steep rock was longthe other was at the calculation and the masses of the calculation and an attentions out which still had because on we respon-

I could not keep my mind on the forest for which we were in a lad. I could think only of kamakaze pit to be benefit this Jap wouldn't try deliberates? In take severa Areas, my with him to meet his a nesters by roding the car over the borns."

I note the constant my eld, however, until we are ver it can destination at the top of the mountain. For the return trip down the

mountain, however, I suddenly remembered that I had to talk over several things with the American GI driver of our jeep. It was colder in the open jeep than in the Jap cat, but I didn't sweat as much under the cutat on the descent

Women Work in Tree Nurseries

In many of the tree intractors in Japan, women perform must of the laber of cultivating the soil, making up the seedbeds, sowing weeding, transplanting, and diaging, as well as the planting of the seedlings on the culover slopes.

In one log yard in Akita Prefecture, in northern Honshu, most of the work of loading logs on bandcars, pushing the cars to concrete aprons, and rolling the logs into the water for making up rafts, was done by women except for the foremen and a few men.

A thought to the second of the

The making of these rafts on the Yoneshiro, a treat, smooth-thowing stream was the step in transporting has from the log yards to the summilis at the important lumber-producing center of Noshirominato.

During a period when rall transportation of the state of

In a wide curve of the rever the logs were colled down concrete apr ass into the shallow water, where these men bound them together with grass ropes into raits about 20 feet wide and 60 to 80 feet long (page 501). The completed raits were tied up alongshore until 18 of 20 were ready to leave.

Two men on each raft cast off early in the morning and by long pales staided the rafts into the current. Six or eight hours brought thru ashore at Neshiramhats, about 30 miles downstream.

Here the rafts were broken up and the lops were stored antil needer, at near-by sawnills, a trial continuous way and broken mills.

In the Comphor Forests

In the camphor-forest region of southern kyushu we observed the process of making camphor (page 5051.

At a small bouse by the fact of the more tain a camphor still was steaming and giving off fragrant fames, in delightful contrast to the odors from mear-by fields. Alongside the house was a brop of bolts of camphorwood of innamenum campuonas.

As we approached, a wrinkled old man took off his cap, howed, hissed, grinned, and went about his work of holding the holts against a footening man related where to take work chips.

These chips were showeled into a big or atainer which booked like a large inverted bucket, smaller at top than at bottom. Water was building under it, and steam rose through the chips, dissolving the camphor into vapor.

This vapor was led through a lumboo pipe into a smader inverted in taket of water with a pan of cold water on the top to condense the camphor oil. As it condensed, the oil fluited to the top of the bucket and was led off through another bamboo pipe into another container, where it settled out into solid cambor. This was then taken out, dried, and crushed.

It had to be seld to the Campbor Control Company, a Government monopoly, which remed the material for use in drugs and pernucles and during the war, in explosives

Farming provides a hydramid for 40 percent of the families of Japan, although onle one-sixth of the land area is sutable for cultivation. Since two-thirds of Japanese farms are less than 2½ acres in size, it may be more accurate to refer to them, as large gardens rather than as small firms

We saw laborious, backbreaking methods used throughout Japan, In the number a parts horses and occasionally own were used for plowing; elsewhere men or women with balnes on their backs did the breing, turning over the saft with short handled, long-bladed hoes. In the early spring men broke up the clock with a small, hand-operated spike-tooth barance.

After the plants sprinted, the famous "Nipper with the dopper" would make his appearance. From his worden pail he would take the tipe night soil, depented by dipperful, and carefully dole it out to the growing crops.

Not a drop was wasted, because fertilizer is the key to productivity of the overworked

Most of the chemical-feethizer far ories had been converted for the manufacture of explisives during the war and were, therefore, highly strategic bombing targets. Consequently, themical fertilizer was not abredient, and night soil, more technically referred to as full senous organic material." niways important in Japan, was now more vital than ever.

The chemical fertilizer available was placed turefully between the drills or rows of sprouting plants almost grain by grain or crystal by crystal.

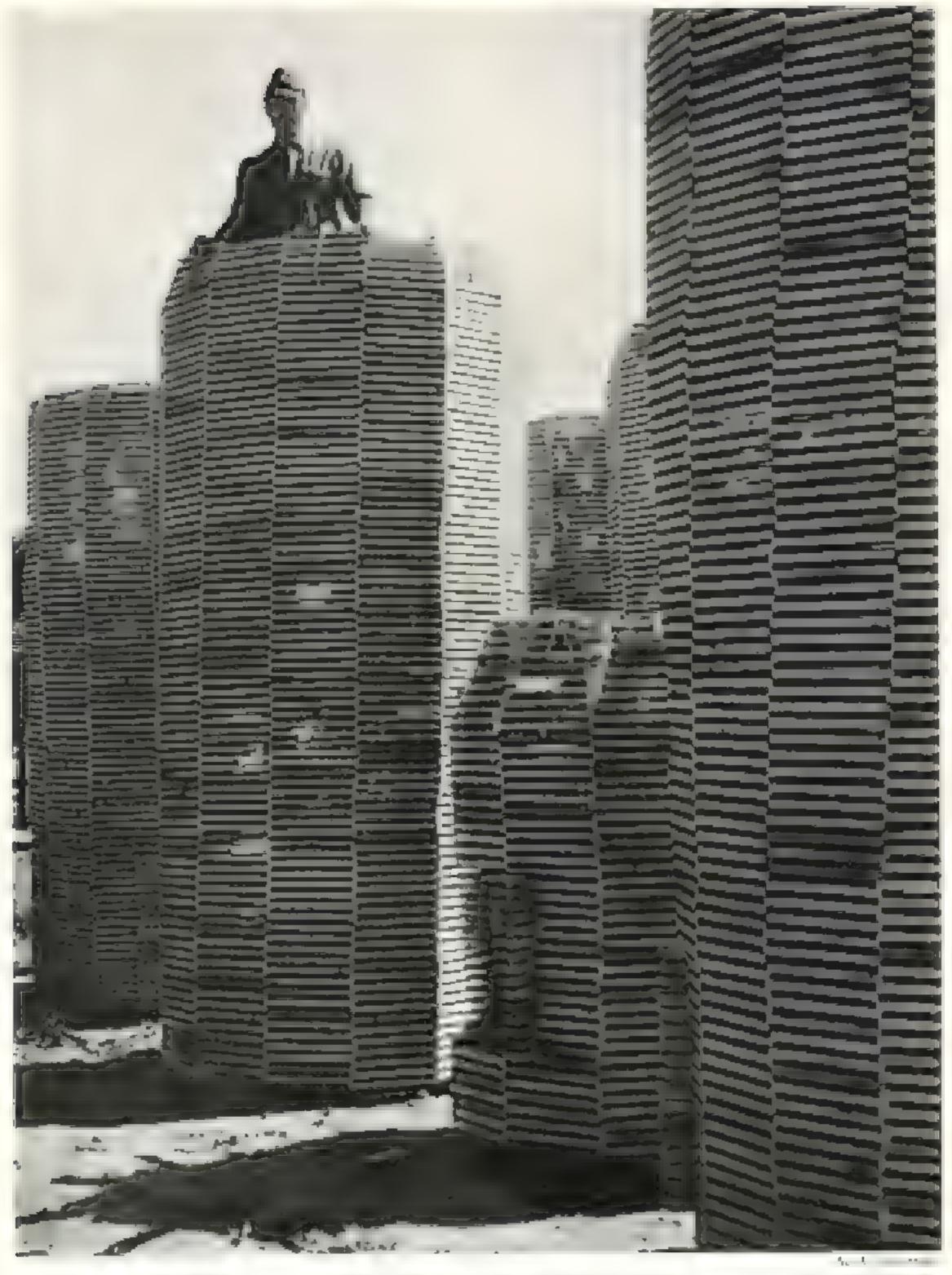
Rice Planting Muddy Work

At rice-planting time then and women worked knee-deep in mud, turning over the theoded soil and renewing, strengthening, and patting down the mised edge of the rar seeds of the grains were broadcast by band on the almost trained surface.

Grass rapes, with hits of red and whate paper field at intervals, were supported on bamboo sticks around the edge of the fields (pages 492, 495, 505, 507).

The types and paper sway inc in the low ze were to state away the course, and also were of some religious significance. As the bright yellow-green sproots appeared, water was kept on the seeducts tatil it was time to transplant the

^{*} See also "Provinces the Hematich," by Alag Rallands In Account No amount of many March, 1910



Like Small Implicing the Lamestone House is Berrelmaker Erects in Lofty Shell of Wood

hard of a second down and are not a specially as a few of the second colors, and a second



In Thrilly Houshin, Cows Not Only Give Milk but Houl It to Market Commercial terms of the first te at a Maria and at the south of the fill and for a new agrice. Let make



B by-th and W open Cart Their Meaner Wood Ration in Tong, Kyushu Fig. 1 Stellar 1, 1, and the state of the first condition American and particular and particular

I constituted by a section of the constitution of particular there a make Japanese 190 to 1 1 1 1/16 1/2 3 32 1-1 1-1



Ytaka Tanaka Doct Some Sections Reading Alond for Its I superor

I come and the term to a substitute for the first of the

eres - I - rows in the prepared and flooded treads in h

I als was done by the whole family—father, mother, promitather, grandmother, and the dildren—in the night-sod-vaturated mud-Little wonder they have to hathe frequently!

Finel and Flewers

Officer we saw women and children from the case of their way to the magnitude a land of land has well to be a land has been a land to be a land to b

Harde Locall ghathey were, the women locally was a spring of the Level Level blossoms of the season, of the season, or the well-known cory, for use in a flower arrangement on the bakonoma (page 564)

Vinest every furnished a bad flowering trees or species with attractive foreign and the built of the yellow-green rice see flings, at weathered brown-an i-gray-thatched roofs of the houses, and the wafte- or punk-blossomed

trees, with a background of a 'there's ento promeela plantation on the billed. we a a color harmony marred only by the buckling

lizions feeling in the rural areas, entirely aside from the popular pilgramages to the some shows or temples of Ise (at his amada). Man, on keep look from the gates to Shinto the sett a result of and strongs of meter tains, and of course in every town of any size.

Hing across them were specially woven tice-straw ropes, with pieces of paper folded into rights patterns

remail a roden shrines were found in sawmills, quarties, and other places of emploment. Twigs of hishaki (an evergreen laish), dishes of food, or cups of sake (rice wine) were often seen in such small shrine;

Hoys and girls, and grown Japa as well reve passed the control without stopping tapay horses. Mer recoving his bat, and



With Candy and Gain, Sentencental Marks React to Sight it Children Clares at React to Sight it Children Clares at React to Sight and attests out both passing has been but at the sent to a sight to an anything else to a grandels stress toy late guils shoulded dalls in instatute of other interpretable strangers for anything else to a grandels stress toy late guils shoulded dalls in instatute of other interpretable strangers.

in the together and are a langing down a for the cut Jap would how stilly and slowly from the hips before continuing

We were told that this was dine in reverence for Emperor Hundito, despite the fact that in answer to General MacArthur's directive to separate the government from Shir toism, the Emperor had issued an Imperial Rescript declaring himself livested of bladivinity and ordering his people not to revere him as a deity.

Horses for Spirits to Ride

In one small town in northern Houshu we or tired stone statues of houses before a Shinto Shinte. A number of them were woven straw shoes over their upraised feet

We were told that these horses were planthere for the their epirits to ride in their leisure hours. In the wantertune such strawshoes seep the borses from sliquing and falling on the rey roads.

Some purposes in the community, madde to contribute armay to the shrine, had woven these straw shoes and placed them on the stone of the divorce spirits has been injured while riding these stone between here in winter, since this devoted worshiper has been been ing the animals so well shoot.

Many of the larger shrines had forest groves, most frequently of planted such tpage 503), to supply timber for construction and repair of shrine buildings. Upon visiting one shrine forest, the priest invited to to see the shrine itself. Many gold and larquer item to be loudy three, had been donated to the entire to the same worsh pers

The priest and his woman helper served as ten in beautiful china caps, dried persimanns, and roasted peanuts. This priest's flock must nive been well-to----

We were told tout some shrines helped support themselves by admission fees from athletic matches, such as sume (wrestling) exhiblicus. Financial support from the Government was ordered stopped, to lade separate the State from Shintnism.

We later saw an exhibition at the Yasakuri shrine in Tokyo where a silk-brocaded priest

referred the boots.

The building 200- or 300-passed wrestlers go through a technus ceremony of afternately squatting on their haunches, rising to stretch one hamlike leg, then the other, bowing, scaltering salt on the floor of the ring (to purify the amount, and squatting and bowing again-Finally the refereeing priest brings them together.

They grasp each other about the should rist and try to show each other out of the ring-The one whose foot first touches the outside

edge is the loset.

With so little excitement provided by such contests, it seemed to me to be a waste of good food to fatten up these mostodons for such endurbitions.

Three Wass Men on Teneups

At every opportunity our Japanese guides would point out to us evidences of Christian

missionary activity.

In one conference room was a will deceration of the Three Wise 31en and the Star of Bethlebem, hung conspicuously so to be seen by the American officers. At one place we were served tea in cups desorated with the same motif.

The guides also pointed out to us young werein wearing cracifixes, presumably former students at a cabelion school. These various evidences of Christianity were to be seen more in the towns of medium size than in the very

small vidages or on the farms.

Wherever we traveled, we were impressed by the large quantities of logs, chargoal, and fuch wood awaiting transportation. Many take road platforms were leaded with such material. That these products were hadly needed was proved clearly in the little town of Tosu in northern Kyashu, where a train of necesars filled with branched faiel would had just arrived.

Almost half the town, mustly wanten, were at the depot with all manner of carts and wagons to help unland the wood and take it to the ration station (page 511). In view of the shortage of charcoal, the rationing officials were substituting fact wood at the rate of live bundles per family pet month in lieu of outhale of charcoal.

In a number of smal, towns where war industries had been bornhed so thoroughly that adjustent residential areas had who been hit, consideral le tribuilding was beginning to Loke place. Most of the reconstruction was with umber produced by local sawmids from logs hauled from neighboring mounts as by wagone or charcoal burning trucks.

There was more progress whilste in such towns and villages than in these less fortunute localities which and to depend an lamber or args being shipped in by rail. This was repecially true of the larger cities, where not only was the dankage more extensive but the transportation problem was also more acute-

"Ginning" and "Chocolettu" in Demand

The sound of an approaching American vebicle, especially the "jeep-u," even on rainy days, would bring the runny-nosed, brighteyed children out of the closely packed unpainted houses along the wlinge streets. They would ware and shout "Hallow-goodany," or "Garomu," or "Chocoletta." We had to drive carefully over the rough dirt streets to avoid injuring them,

In the more remote sections little girls on their way to or from school would stop and now to the passing rehicle. We found out that daring the war all school children had been taught to show proper respect to Japanese

military personnel.

The chubby-enesked rural school chibbren wate a strong contrast to the less colerful and tess chubby city-school pupils in Tokyo and Osnka

Whenever a jeep stopped, crowds of children would quickly gather in hopes of getting a caramel or lemon drop from the Gis. The soldiers seemed to be especially partial to the youngsters who were carrying boby brothers or sisters on their bucks, and it did not take the chileren long to catch on to this. As a result, the older ones would quickly pick up a smaller chief, and they would both hold out their hands for a piece of candy or gum.

Mothers with children on their backs. though shy at best, soon overcome their shyness, in response to the contagious grin of the big Americans who learned to say "Konithreat' (good day), and smilingly allowed

their leables to have the sweets,

Schliers attached to Military Government or tactical units in the small towns made friends easies with the ahlidren. Some little Japanese boys diving for abalone along the rocky shore of the Parific proudly displayed their catch, diving masks, and knives to the American soldiers who were interested, in hopes of getting "signrettos,"

It was a common sight to see a GI teaching the children American words for ordinary objects at hand, and the children in turn would repeat the Japanese words for the same objects is they then d American gum provided to the teacher. The mothers remed to appreciate this friendleness, but the fathers we mendide teachers in mendide teachers in the high and the fathers are fathers.

Ils of pary people of Japan seemed to be learness that the GI for in a being the burder's monster they build been taught to expect was a freenely gentle man

Local shopkeepers it
the videness were usually glad to welcome
hipericans, not only for
the obvious reason of
the obvious reason of
the a two htable by i
ness, but also because
they had learned to exper a mean result
without footing a r
rough treatment

One metance will be before the kind of Occupation our men were carried tool

On a narrow road near the edge of a small town in seathern Henshu a Jeep came to a bridge blacked by a tired horse trying to pull a war or lead of used lumber. The 'colge had sage of somewhat and to crewas a to or Sein horse to the road proper

The front wheels of the wagon were training painst this rise, and the Jap driver was pushing on one wheel while the horse strained to budge the load.

on the bridge floor

As the jeep is the stop, the ranged Jeremoved his hat, bowed law, and helpless, it and helpless, it and help out of the way and the fact of them is an Iwo of them each pashed on a sea while the others pushed from the rear. It has inteed the horse to strain once more, and the wagon moved up the rise and off the bride to a lear the contract.

The Gis gave the 1.7 . 2. rette and



Agenn's Pride, the Wonden Lub, Gets a Rubdown

Section 1 and the section of the section of the best between the section of the s

chimbed back into their jeep as the driver bowed many times, repeating, "Thank you tank you thank you

American Health Pengram Impresses the Japanese

The Japs cament in highest be favorably interessed by such treatment, and by the conscientious and effective job our men are doing

the work on health and satitution, such as 140 f desting, inoculate us, and parifying water supplies is also hound to make a cossion which should be long remembered even if such measures are chiefly a protection for our Occupation personne

Another amazing thing to the 1 panese is



On Her Frame a Si & Weaver Creates an Fabriday I feet in Seven Dazzlan, Clases

The third the state of the stat

The solution has a proper of the formation by the property of the business of the formation by the best of the formation of the color o

Ols Climb but

1 Note that the counter the counter the counter of mustreatment in the counter and of reconstruction to the counter and of reconstruction to the counter the count

the transfer of the transfer o

The respect to the second seco

The many of the party of the state of the st

Min pook, less farons the fight of the them of the Original the terms of the two states of the character of the character of the transfer of t



Buby Lalk in Frigish Fails to Allay the Tears of a Ninper Last in Sascho-

the ear only in the ten Mid age to be to be the formation of the court of the following the first of the firs



1 4 1 1 4 6

I or Gripping Silk Threads, a Panger-tip Wenver Files Her Nails Like Saw Touth No mark that wered, she cannot amond to bite her made, the built-in tools of Ler trace (apposite plan

the volcano were have of trees except for treest plantings on the lower slipes.

Fames and gases of eruptions several hundred years ago had killed all the vegetation, and paw only course gauss grows on the slopes. The Jupanese Army had used these grassy slopes for manerivers and training

We drawe over winding cinder roads, past a U.S. Marine radio and meteorology station, to a Shinto shrine and a Jap weather and wilcass laboratory at the end of the road, about

a mile from the cruter's edge

Clouds of steam were boiling up from the top of the steep, cindery slope. Since the wind was blowing from us to the cinter, we were spatial the discussion at al inhaling the sub-phurous furies.

We made many detours to avoid soft bottomed gullies varying from 2 to 20 feet in

dega h.

Finally we stood at the enge of the crater and booked down into builing clouds of vapor a ling out of the tremendous gaping hale and pertrug from regrind small openings in the lessife wall.

The combination of overcast sky, dark, sindery cone, gray chards of steam, and strong sulphur odor was climated by the sight of a solutory figure of a man in a dark kinner.

He was silhoughted against the sky on the opposite edge of the crater, now unlike, now all wed out by clouds of steam, and mow visible team.

We learned that he was the priest who tended the suring at the foot of Aso. Any wavering worshiper could be given a ready glimpse of the Inferno in the priest's back-yard

Kirishima is a long ridge with a pointed conical peak at its contern end. On this smaking peak, accombing to Jupanese behaf, the grandens of Amaterasu, the sun goddess.

les roded from beaven.

From this august grandson was descended the first Japanese Emperor, Jammu Tennot hence the reference to the Emperor as the Son of Heavis,

Remnants of War and Typhoon

The steep eastern share of southern Kyushu along the Pacific Ocean presents many fine views of fishing values in little bays and of vertically dipping took outcrops instead of andy beach in places.

In this area, as well as on most of Eyushu, can be seen excavations in the bill-ides and especially along road embankments. These were dug during the war for gun couplacements, for read blocks, and for shelters and storage places.

Also in this region were many spectacular evidences of damage from the 1945 typhoen. It has been added to many places the washed-out roads were and it many places the washed-out roads were thought of many stands of pine and sugitimber and had destroyed a sizable portion of the season's rice grop.

The much-intented shore of the Inland Sen and its many small tree-covered islands are beautiful to see. The group of Islands in the Pacific off Matsushima (Pine Islands) is a

national beauty spot,

These islands are small bits of sandstone crowned with the typically Jupanese, grotesquery shaped red pine and black pine, Props densifters and Pinus thunbergii,

Among the "Jopanese Alpa"

Central Japan, along the Kisa Valley, source of much hydroelectric power, and west to the Sea of Japan has many rugged ridges, the so-tailed Japanese Alps, which retain their snow late into the summer. Ontake and Komaga Take, at about 10,000 feet, dominate the scenery of the famous Kiso Imperial borest.

As de from the mountains, volcames, coustal villages, and occar islands, some of the most scenic aspects of the country are the people themselves at their work, the fishermen in their small bouts, the loggers and charcoal burners back in the hills, and the farmers on the terraced hillside patches or maddy valley-floot paddy fields.

The development of a tourist trade which would take Americans and other Allied naturals into backwoods Japan rould serve sev-

crail useful purposes.

The steric beauty would provide real enjoyment to the tourists; the money spent would give the Japanese budly needed foreign exchange to permit them to buy our products; and exposing the people to foreign peareful ideas and customs would help promote international understanding.

buch understanding would undoubtedly contribute to the realization of the acwly drafted Japanese Constitution's renouncement of war as an instrument of interpational relations.*

For full let of articles on Jap 10 and the Japanese Empire in The Geodmartic, see "Carn ative Index to the National Geographic Manazine," 1990, jour e-pectals the lollowing "Japan and the Pacific," by Inseph C. Grew, April, 1944; "Face of Japan," by Witchert Moore, December, 1945, "Behind the Mask at Mudern Japan" November, 1945, and "Unknown Japan," August 1947, both by Willard Price, "Geography of Japan," by Walter Beyon, July 1921; and "Japan," by Walter Beyon, July 1921; and "Japan," by Walter Beyon, July 1921; and "Japan," by Walter Beyon, July 1921; and

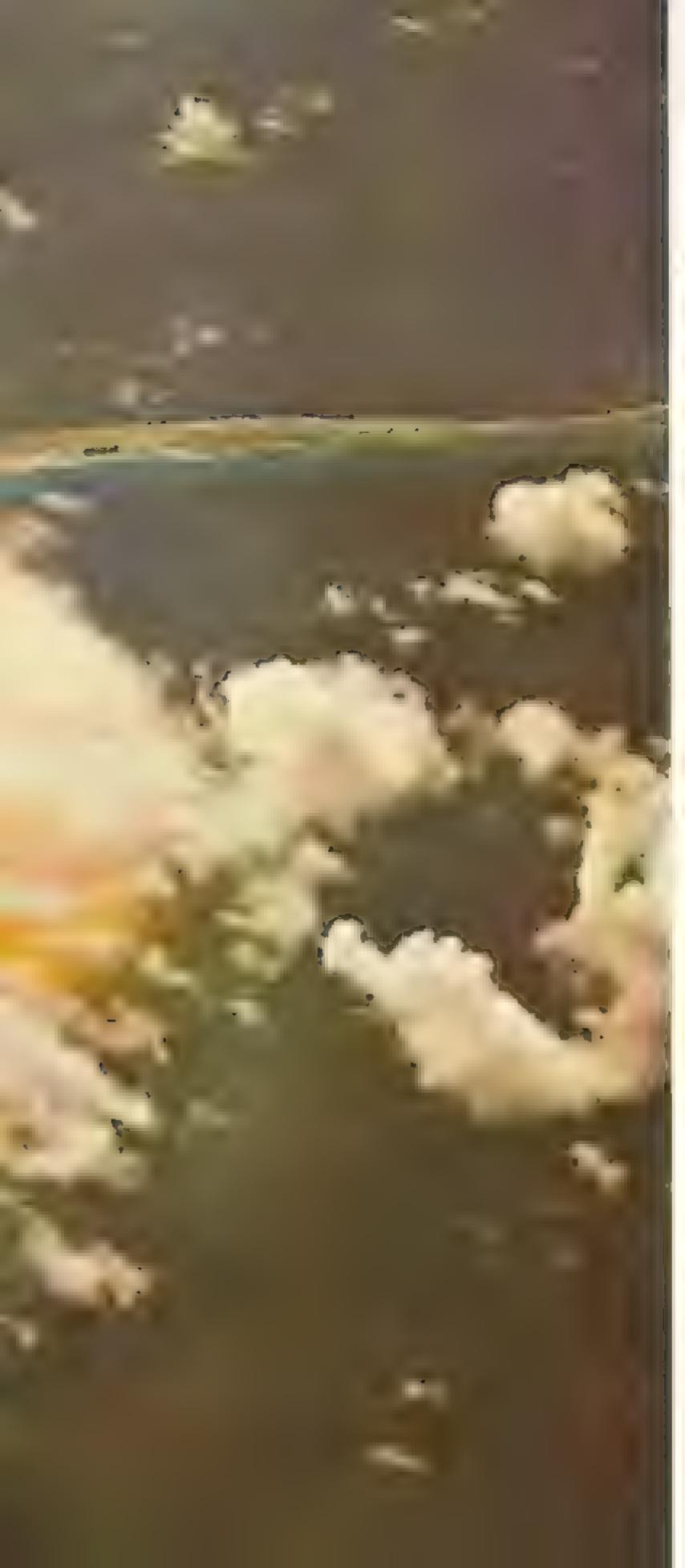


Blans 5 Pirst Atomic Bomb Rides at 30 000 beet in Danc's Dream, a B-29









Places Vager Creek Cheek which the notice The But



Hot, Whist Crisis, Confine, it 18000. Leet, Form on ley White Cape, as in a Cleud



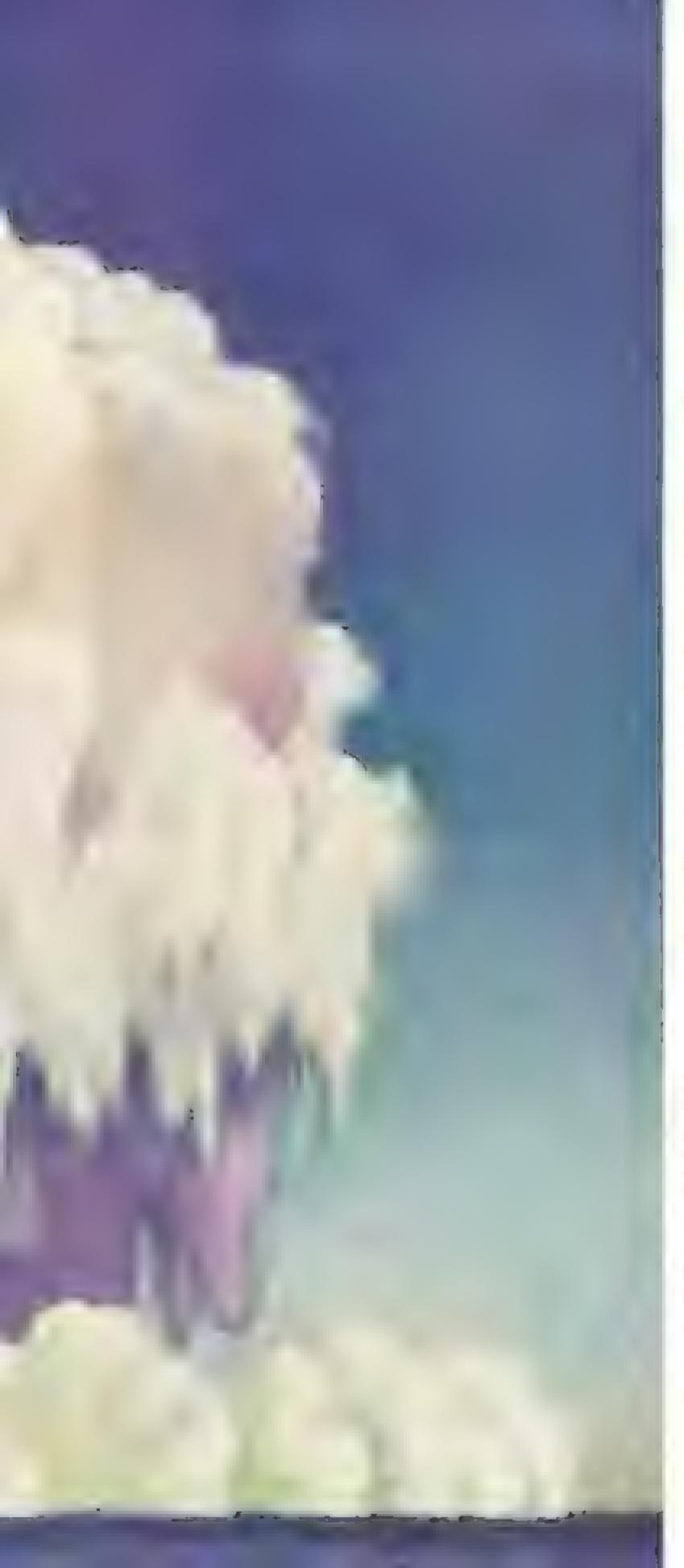
Five Minutes Old, 2a 000 Peet High, the Cloud Region to Lose Shape





One Second Old, the Underwater Blast Sends Up a Geyser Weighing 1st Villian Tens



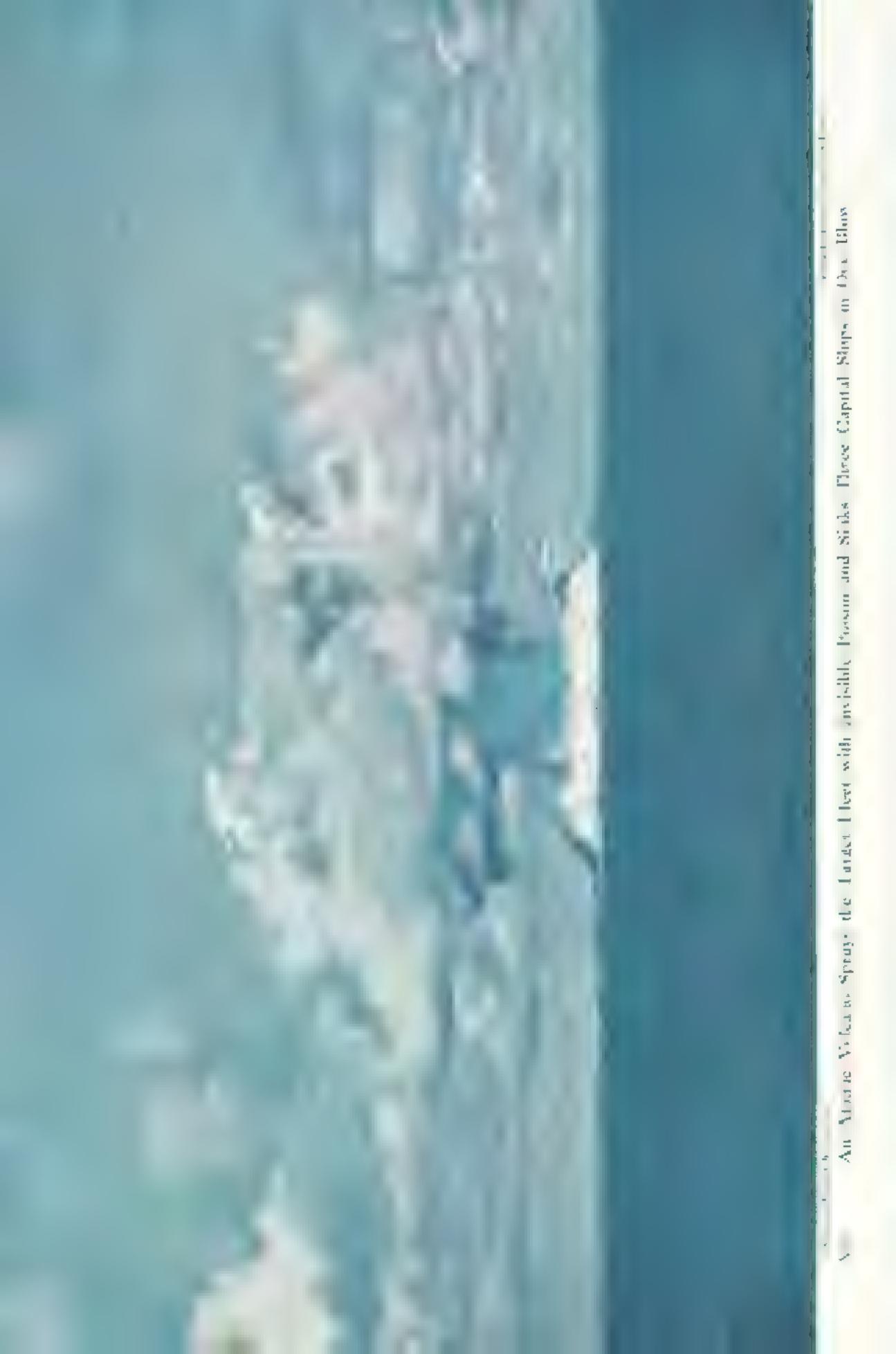


Found Falls in Pumple Statuetites Rigger Last Part estings

in the state of th

11,11 16 113 1 11 1 at he ref to the test the september of the second Later The Bright at 15 - 1 - 1 1 1 1 2 10 10 1 to direct and disease - 1. It It I, In ' 'I Confirmation to the second m " 5 " m , c | 1 | 1 | 7 | 75 | so of the contract of the con-.. u 1 1 5 ... R 1 1 to be the state of the 1 (1)1

I to Transia



The Flying Telegraph

By Joseph F. Spraks

Largermant Colonel, Jacob Corps Reserve, 1 5 3- .

Had the retempte on Other C. S. Truck Steam Car for water

In THIS DAY of such developments as a property of the last of tree, and all place still held by one of the oldest forms of maitary communication—the boming pigeon. These solutions of World War II.

One such him was Jungle Joe, a four-month-old pigeon dropped in a parachute container with an American airborne patrol for beyond the Japanese lates in Buruat. In the jump the medio operator was last, and the unit was thus deprived of radio centact

with headquarters.

Jungle Joe spent seven days in a small liament of outside will the patrol collected valuable infortention on Japanese positions and troop movements. Then he was bremued with an traent and secret message. Flying 225 miles through hawk-infested country and over 1 day mountains, he delayered the fate-ful filt of paper with hiled to capture of a large section of Burna by Albed troops (page 534)

At another time, an Allied unit operating on the Lorder of Burma and Sinm was attacked by overwhelming Japanese forces. All radio codes were destroyed to prevent capture, and the Allied commander in the area lost contact with the retreating unit.

A Matchell bomber was disputched with Burma Queen, a five-month-old blue-clerked ben, and she was successfully paracruated to the open time of the troops below. Released with a message at 6 a.m., the bard traveled 320 miles across the Burma motional of a magnificated p.m. the same day (p. 11)

Butma Queen proved a credit to the second Corps by accomplishing her mission despite the fact that she had bad only 11 weeks of training and was released 120 miles off the

course she had been trained to fly.

Gl Jue Saved & Thousand Lives

Another pigeon, GI Joe, is officially creddet with saving a thousand Albert soldiers'

lives in Italy,

The British such Infantry Division had requested all support to and in breaking the German defense fine at the heavily fortified village of Colvi Vecchia on the morning of October 18, 1943. As Albed planes were

about to take off on a mission that would have bembed the town off the map, Gi Joe arrived with a message statum that the village had been day used by a British infantry in a lag to be a set of a

The time on the message revealed that GI Joe had covered the 20-odd rolles in as many minutes. Now in retirement at Fort Montaonth, New Jersey, he recently was taken to England to receive the Dick a Medal from the Lord Mayor of London. He was the first non-British bird of solution to win the award, equal to a Victoria Cross for humans

On Gundaleanal a signalman received a message from an ofacer, folded it, tucked it in the let a make to the let of one Blackie Halligan, homing pigeon, Army of the United States, and released him into a fusillade of Japanese fire.

Fragments of steel tote into the pigeon and knocked him down into the tortuous them and scrub land. The message fulled to arrive on one; it should have taken twenty minutes. But five hours later, manual and bloody, split down the middle, blackie reached his trailer loft, still bearing bls message

In French Morocco a Hosenhecked pigeon named La ly Astor thew 90 miles to deliver an important factical message. When she dropped exhausted into a Signal Corps loft she had been shot twice through the crop and

once through the wing,

News by "Pigeongram"

Members of the armed forces were not the only ones to recognize these wanged couriers. War correspondents frequently used the birds when they lacked other means of communication

During the war, articles in daily newspapers sometimes bare the statement on the dateline, "via piecem." Behind this terse notation was often a story as gripping as the news that was pranted.

In North Africa, David Brown, war correspondent of the British news agency, Reu-

ters, sent the following pigeongram:

THATTAMS STARTED EVACUATION OF GARSA ONLY HALF HOUR POST FORMAL NOVELOCK MOVERS OF A 1 TO SELECT AR AMERICANS OF A 1 TO SELECT AND A 1 TO SELECT AREA OF A 1 TO SELECT AS A 1 TO SELECT AREA OF A 1 TO SELECT AS A 1 TO SELECT AREA OF A 1 TO SELECT AS A 1 TO SELECT AREA OF A 1 TO SELECT AS A 1 TO SELECT AREA OF A 1 TO SELECT AS A 1 TO SELECT AREA OF A 1 TO SELECT AS A 1 TO SELECT AREA OF A 1 TO SELECT AS A 1 TO SELECT AREA OF A 1 TO SELECT AS A 1 TO SELECT AREA OF A 1 TO SELECT AS A 1 TO SELECT AS



At the Besert Training Capter in California a Tank Commander "Single Tosses" a Placent in trassang, the busis are often released shock, out in combit operations " and have a restrict to the control of the control of

In bringing this first new of the fall of Gaisa, the pageon Yank made a 90-m. thebt in 110 minutes. Yank with by accoing several repeat to account the African in the African pageon.

the souther war composition to the No. 7 section to the total the total to the total total

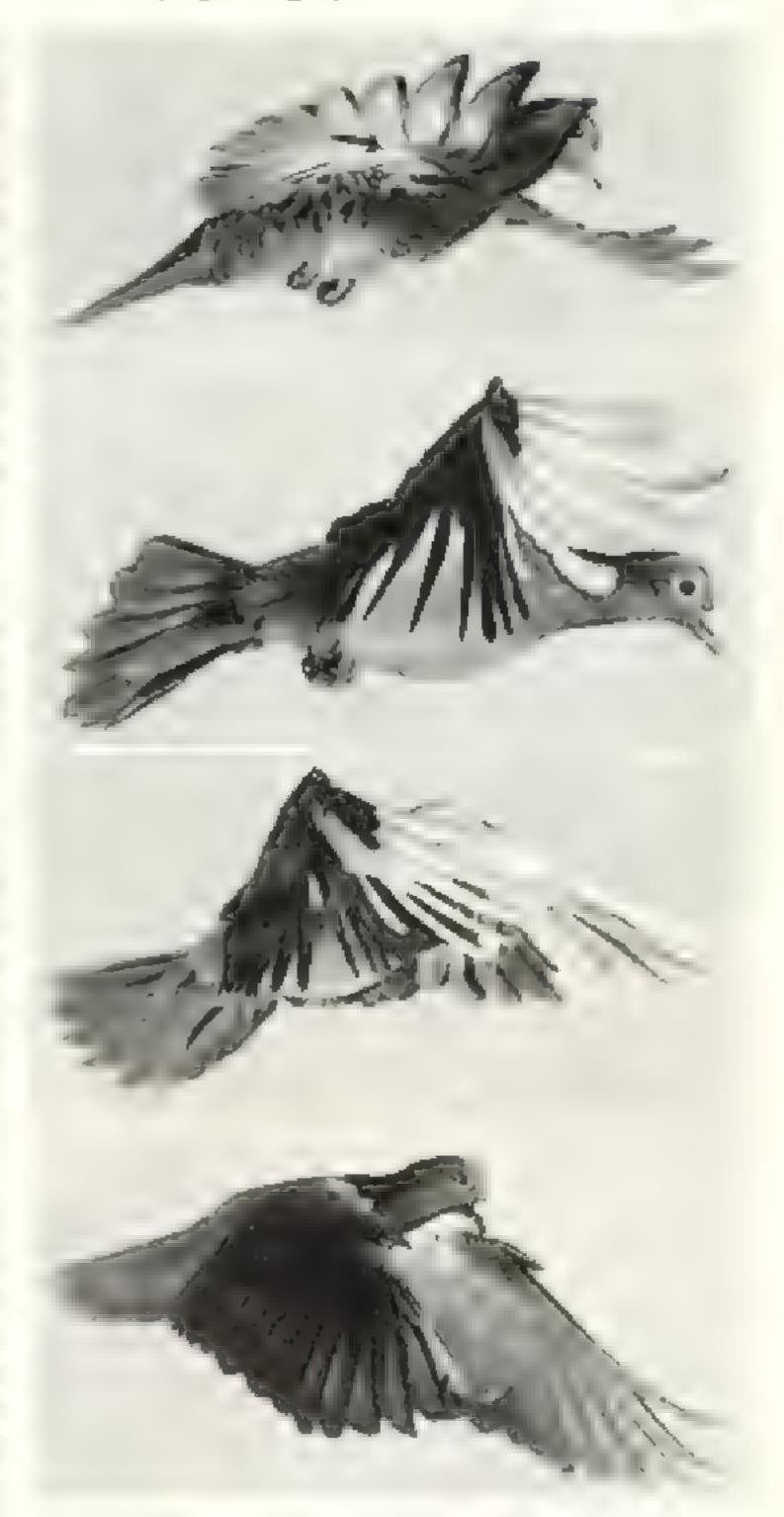
the thousan - it we time a chievement of homing precuss. One parent six thousand messages in a continuous of the continu

A the close of World War in the Second Secon

September 10 the Arms

(A till a substitute of the september 12 the first of the september 12 the september 13 the september 14 the september 15 the september

in a jeep or aboard a ship, thy in an alralane, he carried to hack or on a war to see a society or a contract to the carried t



Wind For there Open and Close at Every Stroke

He sold father plays its part is rescaled by the consers's spot act. I do give the case are raised in the apstroke (rap period on the apstroke (raped as an are recorded to the period of the apstroke are recorded to the period of the apstroke are recorded to the period of the apstroke are recorded to the apst



"Private Jungle Joe Reporting, Sir"

When only free months old, this startly had was done set with an earborne partral helified the Japanese faces at I as Welessed, he flow 225 miles aver the rate of the rate of the open of the control of

secret mission in a manner which even yet approximation loss. I Works who keeps, the Navy, the Coast Guard, of the Marines go, a placen may go also,

1. Vide-an-hour Speeds

Then the war the Army Pigeon bereing trades 14 to 2 to note, if which he is a consecutive date.

theat advances were made in training the birds. Speeds and distances achieved by lowers in our to congress have stendily in used. Now flights of 500 miles a day and speeds of a section 70 miles and bour under ideal constant and continuous and at the fermion took by the press.

the a Wirld Way I, the pign rear was begon to have to reserve the total and the extension which he are had not received if he daily not receive tetures of name than 98 percent.

bre by a sent out the dove which te-

turned to the likewise and isolation through

The use of pigeops to carry messages is as the as Solomon and the areast to rese who probably learned the art of training page is form the Persians. The names as to their Olympic is the same areas back to their versus out its back to their versus out its back to their versus out its back to their versus.

In the time of the Romer. Programmer, Industrial State of the series of the place of the contest of the contest of the pecker up their peckers and case.

Documentary evidence of the tise of the binning pigeon in war dates from 43 B. c. when the task we have event in Maria is broken by Mark Amery, and the common through the time with the time with the time with the time.

"See "Man a Frankered Friends of Least State of the Late Harmon, Narrowal Greenstern - Manager 1 - 1



Burrou Queen Flow 320 Miles Through Burrouse Mountains in Nine Hours

by pigeous, which flew over the basis of the besieger

An actual pigeon post was established in Begbelad by the Sultan in 1150.

dir ag the Crusades, now when King Louis IX of France levaced heypt in 1249, his arrival at Damietta was reported by pageon to the bultan at Carro

At the siege of Haarlem in 1573, William of the court is the court of the court of

Auting the months of the Siege of Paris 1 he I rance, he can War of 1870-71, some 1870 for a divide and emilion private messages were carried into the city by the winged contiers. Many pigeons were sent out by balloon. By use of microphotography, a single in could be a few forms of microphotography.

papers thus plot at tplied were enlarged and to ad by marie lamers.

First Military Pigeon Lofts

The effect of the perfect of and the organization will note, and the many became one of the first nations to a full list military pigeon laise.

Pigeous were introduced into the United States Army in 1878 when the State Officer of heart were it at a Pin thiple time end to the Very Report of the product of the However, inexperience so the product of the West. Later experience has been always to the West. Later experience in the Albert and the Research of the West. Later experience in the Albert and the Research of the West.

Up until World Was I a mean, a pigeon service existed in a property from a contract to the late of the



Poster-Greed, a Pige on Suffers a Message of By Albace.

The production of the contraction of the production of the product

The difference of a Chila is he had appropriate the difference of the difference of

The harmonia to the household part of our relative of the innectal brokes of World War I

Outstanding were Cher Ami, which have to one of the page of of the Last Buttalian of and the form as a second of the 25 minutes with one leg and second by shrapped and a

helethrough history
and Preserve Wilson,
where we less a second
their bodies were
mounted market are ones
biblion at the Smith
souther Institution.
Washing to the

The Morker, rechar war-warded the Later washed the Later washed the Later washed the Later washed the Later had been had

The Kuiser, Pigeon Methwelch

Location of Me

Incerist as the power

And removes hird sign

Kalon Asas one to

this German polymy

and when he hands to made

I the hands to a line

at 1914

The same of the sa

The Katter stall we are

identification I had to proceed the seat of the Great Inverial Crown. He lives apart to the least to the state of the best to the lady Belle. He home is equipped with an electric bester.

man Army bards were captured and are posman army bards were captured and are possitioned at F et Montmucht. But i reported that The Kuiser has become a mabore ented with the American way of and last be will have nothing to be well to products of wart.

Nome months and The Kalser became very ill, and it was feared he did not love to the layer. Arms the latter to the contract with

Dr. Alexander Wetmore, Secretary of the
Smuthsmin Institution, to have the bird
mounted when he
passed away. But the
expert treatment of one
of the Army's hest
awian pathologists
brought him through,
and today he is a we
and nealthy to celebrate
his thereigh him thirday.

Homing Ab lity Improved by Training

In recent years to be ably no other Arms in the world has devoted as much effort and care to the training of none tog pigeons as has our own. Similar work which attained considerable success in experiments with homing pigeons as long and a 1807.

the rather that the total and and carle for me to be total and carle for our birds to wasting and carle for our birds to wasting and carle for week pob, with work - at the before summy and continuing after some was the prepared of the prepared of his long, have work might save a life

or deliver a message of vital importance.

If a nonling place is used by the Army for signal communication is a distinct who is ested if rough a refuj or sobrecting aimed at the trigger mass are a cance and speed in a model of refuj or a linear and speed in a model of refuj or a linear all pht.

You dispring pigeon should have a short, for bit 2000, a contatent and been all the managers and pieces. At he is a contatent and term all the pieces to be a provided or the little pieces and the pieces are the pieces and the pieces are the pieces well to be should be relatively after the whole well to be feel.

randing out ristingt and bright are a good an ignified that the hind is healthy and in



Not "Bonds Away" but "Birds Away" Will Be the Cox This I me is not a little to a little to be a

satisfact my condition. I have found it usually wise to avoid white or very hight-colored pigeons, since they are more readly seen by birds of prey. A full-grown cook high-should weigh from 14 to 17 offices, and a hen from 13 to 16 pages.

Wary I K'ss Soils Union

he tall and started from the continuation was a first the school of the first and a second from the continuate, as murital kies ensues. The continuate in his thus sealing their uples

Instead of letting Nature take its course.



Young Homers "Pigeonhole" Themselves in a Mobile Army Laft

For not do a contain one for all parents and the find of below and channel occupy to



Even Though Their Loft Moves Every Day, They Still Find Tueir Way Home

The control of the highly mutide operations of World War II. Army tea near released to the control of the control of the fights familiarize them with the vicinity of the control of the c

most pigeon breeders select mates for their birds, thereby blend up the most desirable tharacteristics of their thak, Proper remongramous and once mated will use the the paired for life

Breeders generally allow their pigeons to raise no more than three "rounds" a year the time varies with characte, but we usually noted our birds in February, Murch, and April. After mating, nest bowls of eartherware or pressed wood pulp are placed in each current partment, with tobacco stems and other nesting materials each as wood shavings near by

Pagents Have Schedule as "Sitters"

the afternoon of the seventh to the tenth is nifer mesting has started; the second about 14 hours later. Theger of one youngster better when the parents do not cover the first reg

unti the second is laid. Then both may batch within an boar of each other (page 241). The incubation period is from 17 to 15 day.

Both parents take turns sitting on the call here sits from about 4 in the first and usual 10 the next normale. For man bird is the remainder of the day. Is the purents feed their coungsters by a call this of the also more known as pigeon, and

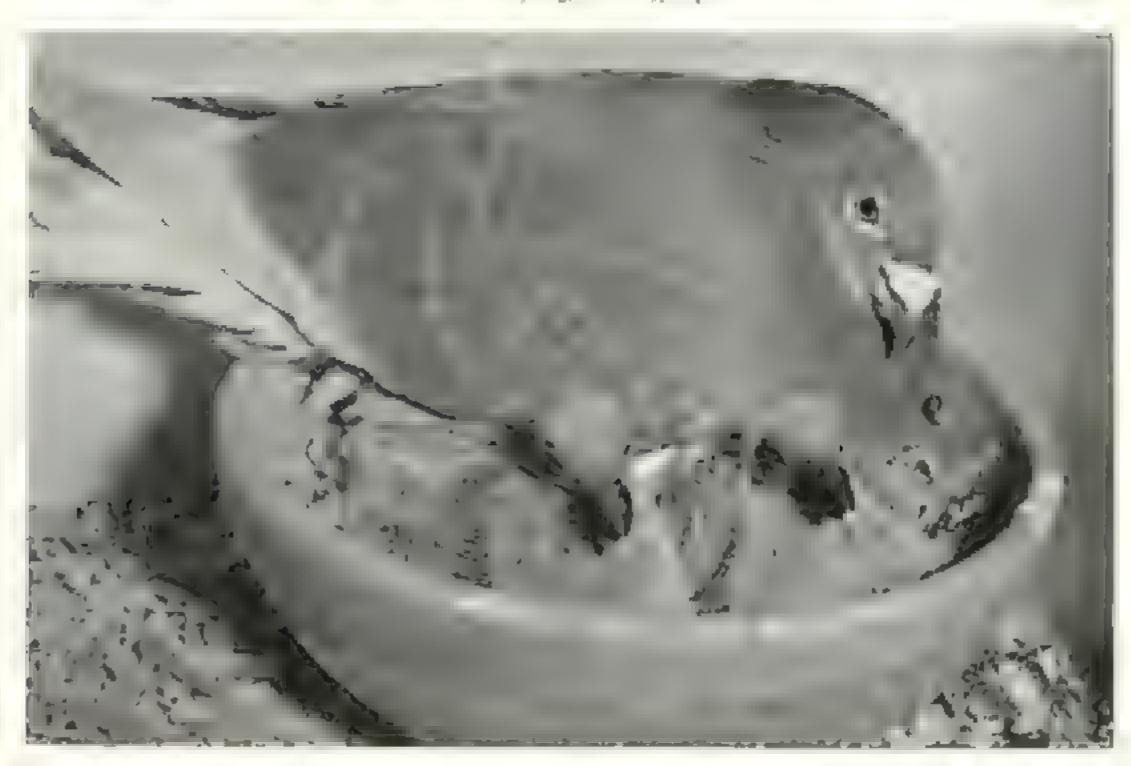
When the young are five here we do not one there are vaccina ed against place is percentage common disease of these birds. This is done by pracking five or six feathers from the breast and brushing the vaccine into the fell ties.

All pigeous except those specifically reserved for twenting purposes undergo training from the time they are 23 days old until they are of no further value as message carriers. In the process some are weeded out, for regardless of how good the parent stack is, a proportion



With a First Stroke of the Wester Wings a Hansing Figeon Prepares to Aught

for a common than the analysis of the Parish that the best and the first property of the formal and the first property of the formal and the first property of the fir



Housing Conditions Grow Growded as Youngsters Fat Almost Their Weight Each Day

Squales dut le their weeks in the first 48 hours for two or directops they eat only pageons milk, a cordide substance from the crop of both paper. But some the set food is mare it at a mare in the paper is the seth of seventh day a placing five, young, and like down. There is the tale, often both est about a small armount (page 559). These is make with their mother at Camp Counter, Missouri, pre 8-day-o d homing piecous.

of the progeny is found unstitud is for noted to get service.

The matter ability to return home from long distances is an inherited gift of Nature But to develop it to nightest pitch and make it of maximum use to man, constant trainage is pecessary.

Before the youngsters can fly they are allowed access to the settling case or avery to acquaint themselves with the surrounding ter or. At the age of 28 days they are released for short flights in the vicinity of their loft

As soon as these young birds are sufficiently strong on the wing, they are placed in a basket and taken to progressively more distant points until they are able to fly 100 males. The points of release should be in the same general direction from which the birds are expected to fly in line of duty.

thach time the hitch approach their loft their to use the posterior to land and enter asserted by a low whistle and rattleig a tin can containing feed. As soon as the bird enters the laft he is rewarded with his favorite grain

When the transite of your esters is started it must be confinued daily, weather permit-

ting. The pigeomeer must take full advantage of favorable weather, since exhausting the development and impairs the courage of the growing youngster.

We normally divide the traiting of homes into two categories—short-distance and long-distance flying. Young birds, or yearlings on trained to fly up to 100 miles. Exceptions is promising youngsters, however, are some and lown to a distance of 500 miles in their first yest.

As the bird grows older the training been more streamous until he is able to fly up to 1,000 miles. Pigeons kept to good condition can usually make long-distance flights until they are five to seven years old.

Mobile Wor Put Pigeons on Wheels

With the outbreak of World War II, how ever, it was found that training pigeons thome" to a permanent statemery loft wing ten right. Tactics and techniques of fighting had been drastically obsessed. In this new strate major emphasis was placed on tapid mobility.

To keep pace with the moving modern wa-



Eight Pigeons Are Shout to I see to the Nir-but Not to Fly

the make make my the solution of the feature of the



Last Radio Betray Their Position, Paratros ps Use the Philips Telegraph

None the worse for their parachule ride to set, himsoft pageous there all with messels report in the interpretable cylinder-type paracture equipment is made in two sizes, for four or eight place with 5-boot or 0. sot chare.

we started developing mobile hifts, and by early 1942 we had devised a 50-pigeon traiter that could be palled by a jeep (pages 548, 551, 546).

Tals was a recolutionary filed in the technique of training blods. Pigeons actually had see our fourists, and their home was wherever he trains and jeep might be parked to job now was to train them to return to a one that was frequently on the move. Note he pageons rose to the occasion.

Under the system we developed, mobile training starts as soon as the hird leaves its nest. The pigeoneer spends much time in the loft, feeding and watering the volumesters, to make them as time as possible

As soon as the birds are able to try their wings they are released in late afternoon without their customary feeding. Since they are bungry and dark is approaching, the birds do not wanter far, but they get a good thince to deserve the surrounding territory.

During this training period the mobile loft is never allowed to remain in the same location more than one day, but in the early phases at as moved only short distances—about a mile As the pigeons become stronger on the wing these moves are increased up to five miles and

rare is taken and to move to the same breation twice

This method of training gives a commander pigeon community attent on whort notice. A mobile loft is moved to the new location and on the first evening the birms are placed in caskets and released from short distances by the end of the lifth day the pigeometrican give his commander communications from points 50 to 100 miles away

lime and again, the tigh the untiring efforts of a good Corpa men, those birds have been trained to home longer distances to new ocations to as little as seven or eight day after arrival.

Night Flight

Pigeors have even been trained to carry messages at night. Patience and persistence succeeded in inducing them to reverse their living habits and sleep by day and fly after dai.

Another achievement of specialized training was the development of two-way pigeons for back and forth tlights. It his was accomplished by allowing pigeons to feed at one point and obtain water and sleep at another

in our training—at least officially we shall



Firm but Centle Is the Launching Hold of the Seasoned Pigeoncer

And the left result to the North Sentence of the part of the first burd of the case of the



For Pales Loans a Back Saddle Wessins Holder May Re Liven

The grant for the property of the state of t



This I be Handful of Placen Has Been Selected for Breeding

 $\frac{1 \setminus \{ (n_1 + \log n) \mid \{ (n_1 + \log n) \mid (n_1 + \log n) \mid \{ (n_1 + \log n) \mid (n$

not use the bit which there is a denoted the making the filter posterod technical from the making the filter posterod technical broad to be present to be present to be present to be a selected to be a selected

Like the posters that the control of the soul of the part of the control of the part of the control of the cont

Sanitation is not disputible to the second second and the second second

A Presen Drinks Like a Horse

Figure 1 is ther mand be kept to the lott, and the lott, a good drink are, a so ike the lott of the report of the lotter of the

The region does at these as speed him.



Many a Florier Fell under the Talons of the Himle

Two American softlers in France deploy a basek that in the earlier of the forest than the entire the entire transfer of the forest transfer that the entire transfer of the forest transfer to the forest transfer that the forest transfer the forest transfer transfer



I: 3 C 1

"O K. Little Fellews, You Tell Em Where We Are"

I is the total total total plans of the property of the state of the s



Des alceting Removes a Pageon's Nonpaving Passe agers

If pass it is not often the transfer of the and same sequences. The soulest are as a transfer of the soulest of

is head to a dainably, it thrusts is beak does and takes long, deep a sound the interest boose.

The pently, a drinking fountain must provide a depth of an inch and a ball to two rubes of water at all times.

I have heard of pigeons swooping down over a river or take while in Hight and scomping up water in their beaks, after the manner of swallows, but this is musual

Overfeeding is a frequent error of the novice and may result in spolling a good pigeon loo much food makes the birds listless and shuggesh.

Puring training, pigeons should be fed only.

twice daily—lightly in the morning abundantly after their exturn in the evening of more than one training think is made in a day. Lieds should be rewarded after each flight with a few grains of their choice feed the pageon's diet consists of leganinous seen, cereal grain creen facily, and gut

Birds of Prev Often Attack Homers

The principal hir !of prey that attack burrols an falcons hawks, caples and kites. In the land the piggon has one of a - most terrine age under and a re- bound, and in was Generally тие ридени сып ексаре by use of its speed and eventuress, but for rationally one of our inarrived at the loft form and bleeding from such an actual atta b

In areas beautive in 1 stell with predators the army discon beautive to a body to a bo

I have seen the sharp-shinned and Cooper tree half was

and the telesce. It is the ideases up the passes garefully the enter the total and is seen them even if an air equal to seeme their meal.

Losses from hawks generally occur when pigeons are in training. The older and better trained the pigeons are, the fewer losses then will be. Well-trained thirds are alert and hold they leave promptly when released, fly fast and dive or take other evasive action prochy at take of data.

though is the run-teen most frequently as all though homing pigeons is, "Why do they alw come home?"

M 15! Incels, some rummals, and son baccts have up mer planned and ty to bod he to way to distant sents. Man bus long. a i , w i by the my i... · La read the male to as the transfer . 1 1 11 7 11 * 4 F 121 + 1 LIA F JI SHEET IS 1. March 1. Adjusts. ever tell light to (-) Trees

Pideoos Have Returned Thousands of Miles

Lends appear to have a member that washi put the prove-I tal elephant to Come. Piceon functions onquently sell fine besiting stock at the state for mading to the No. 23 Act of the State reseally as me 110 1 1 1 1 m 11 1 relate to their home loft. There are name: ous records of birds - pur fter eight er 1/1 affice and a little and of miles-som times over a tion sat the form of the pelar fall

A pige face of temple for a second to the second temple of temple of the second temple of the second temple of temple of temple of temple of temple of templ

his me brook is a ser to the front Caracas Vertically Several months later this bird is per and returned 3,000 miles to her origman with a later later d

for the feet of the skalde flocks on a cold to the file to the second of the form the second of the short of the form the file to the file

In Spanish while the wear against a live and selection of the second selections and the second selections and the second selections and the second selections are selected selections.

to the Mark Comment of the Comment o



Rolling Courses Direct, Physics Chart Up

The table to the table to be a like the control of the table to be a fine to be a fine to table to be a fine to be a fine to table to be a fine to be

Radio Waves Had No Ffeet

there was a remarkable of the construction of a constructed section of a construction of the pigeons has a constructed a construction of the construction of the construction of the construction of the constructed with a constructe



Culesces Man Be S. ished well Dest. but Piecons Demand Bath Weter

the hold of the state of the solution of the term property property of the solution of the sol

a few hundred yards of the pigeon lofts.

Though I multiwhed a loft and trained

I eas to the trained to a continue to the radio station for several months, not one did we encounter any difficulty in our Italians program.

the other hand, I had one experience which still has me myst had. Veteran present tracions had told may they had found certain had on a body term by the formal resources. It was a proof of a long to the following the tracion of the following the proof of the following the form the following the foll

In this location the pige us would by around "athly and where released at contact particles would segmentates never return to their burns his the chiral fraction was a long to the late that the make the substantially are burns as he was being a late to a late of a substantially are properly.

Later a radio team training for exercise, in week into this and the original order are a substantially as were and reserving taken as males.

The Mystery of Hundad

Some investigators feel that the answer to the mystery of hunday lies in the extremely keen evesight of this bird. We know that its thing is very acute and plays a large part in as trapme.

I can well understand how over 11 in the periods of the periods of the periods of the period of the



Its Home is Hidden from the Arman's Ever Yet the Homer Dies Struckt to It

A piecom with a message construction of the first of the whole, the first of the property of t

count see how there is be the asser-

After the semination seleptor in the process and conline that the some committee is a faithuse by which the construct by the we the line to be dy

Out of the only to a portion of all the plot servers file, a piece that we appropriate the protect of process, or proceed froming the physically fit, and it numbers to be proceed to be proceed by the physically fit, and it numbers by the physical part of the part of the physical part of the ph

An at yes at 1 and Why does the fier operation always are a frame? I want only answer: I say only a power to the field is sometime? Your wall have to see the plant.

Well Protected Against the Licensen's

Light showers and must progress the letter about upon a resolution of the trade state of teathers are processed by a waite coasen.

snown as the rest is the m. There are presented that the area of the same and the same and the same area.

Show, wheel and he the how an excise effect, but low temper, nor substances about in the house he can be the recome and the properties of the recome and the possession of the properties of the

When head with a streeth contract the property of the property of the property of the property of the latter with head and then descend and copy must by the property of the p

Pige of the let the at only about 500 rest, but our experiments in the incition with the Army All Forces show that the color tare



Though a Landbiblior, the Pieces Will Div wer Water of it M st

The property of the second contraction of the property of the



Jan 11 - gr grand lyn . . .

High-speed Photography 'breezes" a Pigeon at the Moment of Launching

to the photocole taken it is the first of the medical and the

will sent of green who dy hid white we without

The summed and it is recently to 15.9 I feet. The structured and it is retained. The shiftening was their restricted to 12 to 2, most to 3, to 2, and feet with the interpresentation of the later which the interpresentation is the presentation.

The new word wrapped in servy further delicing and was wearen in their least with their least with their least with their least with their research to a state of their features confess on the first least their features confess on the first least their least.

the notes we whether their older fears as a function to the fears of their out to the flat to their and their out to their the flat to their their out to the fifty to the fire their out to the fifty to the fire their out to the fire the fi

Sand an beitet it man fine dozen it en de will not present a pier it, since the high bas a day less terres or parent excelling the slames and as the eye look, a shipper. The line can be some offend at will and any loved to fire the eye of a significant material.

We found however that your dependent of the content of page of the flat of the page of the content of the conte

there has now to wore obtained by spherical training to obtain a training to obtain the meanth in the description of the parties a work out of the parties a work of the parties a work of the parties and the work of the parties have the parties at the parties of the parties

Under nearly on arous the prestret have a same at part ators for all and the community, with a larger season to the place are healths.

Most interesting to me was the training of pigeons for use over large toolles of water ship to share, shore to ship, and island to island. Normally, a pigeon will not thy voluntarily across large expanses of water, and many a pigeon fancier has lost a race because his birds followed the shore line of a lake or buy instead of taking the shortest distance across it.

But early in 1942 this new type of training was begun as a result of a need for piecons for amphibuous operations. Subsequently I worked off the east coast, near Annapolls, Maryland, and also of Florida in the Gali of Mexico.

A Natural Fear of Water

I found that it was not necessary to do much training for ship-to-shore communication. Since the nied had a natural fear of water, when he was released front the ship he made a tecline for home. These birds flow almost a true course to their home loft, regardless of the distance they were released at sea.

The pigeous had been placed in crates far below the decks before we sailed, and usually when they were released the ship was out of sight of land. In one case they were released busing a fog, but their time of arrival was not affected. Their average speed over water was greater than that over Lind,

Much harder was the task of training pigeous for flying from shore to sup. To gain success it was necessary to take young birds before they could by and place them in

Each day these wagoing pigeons were allowed to sit in their observation case stop their loft to view their ship and the water about them. Never in their training carees were they allowed to the over land. They were strictly amphibiens birds.

Indicating Galls Almost Proved Fatal

During this entire training period only one bird was lost. He perched at p a smokestack and was sufficiently by the fumes. We almost lost another when he joined a tlock of guils and attempted to kind on the water the way they did.

With the coming of peace, the Army sold its surplus pigeons to private fanciers, and

many are mor being used in the sport of pigeon racing

In the United States, as well as other countries, this sport has many devotees. Nowhere is it more popular than in Belgium, where nearly every village has its societé colombo-phile, or pigeon club. There in 1818 the first long distance pigeon race of over 100 tailes was beld. In 1820 the birds were raced from l'aris to Lièpe, and three years later the first cross-Channel race, from London to Belgium, took pince.

Belgium's annual Concourts National, a face of about 300 miles from Totalouse, France, to Brussels, was imagurated in 1881, and in the same year the first regular races in Great Britain were held, from Freter, Piyonouth, and Pentance to London. The special attained at that time was about 1,250 yards pet minute and was soon to be surpassed One of the winners in subsequent races of the London Colombarian Swiety attained 1,836 yards per minute.

Each loft is equipped with a trap which parmits the bird to enter but not to leave. In races, specially designed clocks record the time the pipeon "traps,"

A Pigeon That Walked Home

Some enthusiastic fanciers will tell you that their hirds will come home even if they have to walk and there are authentic cases of pigeons actually walking home. Clarence did.

Clarence's home loft was at Fort Mende, Maryland. One day, on a routine training flight, he and several other pigeous were released at Odeaton, Maryland, a short distance away. At supset the birds were safely home

all but Chrence; he was A.W.O.L. for reasons then naknown.

The pext day one of the soldiers was walking down the road in the direction of Odenton when he sighted Clarence—walking home! So thehow he had fall en into a pool of oil and his feathers were so plastered that flying was impossible. Being a dutiful pigeon, Clarence took his bearings and started "picking 'em up and laying 'em down" in the manner of the infantry soldier, strutting steadily along the road toward Fort Meads and his home had

A homer if I ever saw one:

Votes of there is a place of a respire to a restrict the met of the another off, the other of and the North templates of the North templates of the north templates of the restrict of the restrict of the north templates of the nor

NATIONAL GEOGRAPHIC SOCIETY

GROGRAPHIC ADMINISTRATION BUILDING

SINTEENTH AND M STREETS KORTHWEST, WASHINGTON & D C.

GILBERT GROSSESSOR, Proc Jept ROLLERS V. Flahttage Inground HERBIRT A. PORT. E. Amakant Street of LYMAN J. BRIGGS, Camman beautiful beautiful Millar, N. M. PAYNE, Ambiana Sectionals. San To 194 3 18 But 1 18 18 19 19 19 19 19 19 19

JOHN OF IVER LA GITHER. A vis President. THISWAS W. MCKNEW Someone VERNON II. BREWETTER Assurant Sources. 1 8 1 1 - 1

EXECUTIVE STAIF OF THE NATIONAL GEOGRAPHIC MAGAZINE

GILBERT GROSVENOR, EDITOR

J 2L BILETLARANIE	FATOERICK FIM 1CH TORRANTEGORI	FRANKLIS L. F. 8-181		
MITALLE BULL GROSTENOR I VM ROS SM. GLYSLIFY	for the Burkenship	MANNAR ONFO WILLIAM For a reduced ball W Robert Dans Formal Education of Soft		
MEN MAN BUNETEAD Research Lord quarther	FREDERIC K. G. A CONT. III 337. Editorial Staff	LUIS MARCO S Ferreget Estatemal Staff		
Coltable 5 to Religious and State St	Chief of School Serring WITLIAM 2010 904 95	THE PARK F. KOC		
	1544	LIMIN L WEST E		
RAYMOND As A Short	F. Board Books Cont. Ports. Education St. 39	WALTER MEAN EAS SHAFTED		
CILILATE LA GORE	INEX B. RYAN	hells forts		
CHARLES EVANS IN COMES For body Class Justice of the Forest States V. That S. GIFFARD Logic copragate WILLIAM V. PRATT MULLIAM V. Sang, Rained	BOARD OF TRUSTEES HOHERT V. FLESTING Freeders and Chamban at a v. Hearth, K.gr. National Bank 11.11 ARNOT D 1.5. Anno Anthogen Library v. Marchigen	JOHN J. Parksaltent the tens of the A. commit The timed States CHARLES G. 1144 M. Book with Arm Decades		
LYMAN J. Bit (6006) a free coe feats test free por bit and argue Retire!	President Menorgodznyk (w	At the United States A Lib-H & A & A = 15 Lanevar and N = 1		
Policier S. Land of Street Comparison Compar	TARREST FARMETALL TO A CONTROL OF THE PARTY	11 YE HENDELD CHARGE TO THE BOARD CHARGE TO TH		
Communication of Logistus many		K v v v		
(D), (16,2) (HT	1 1 1 10 10 10 10 10 10 10 10 10 10 10 1	Account to the of the high-regal		
L H s's F Petro et	MALATEL TEL GROSTEST K			
ORGANIZED FOR HE KE	10 Ac 380 11 F 1004 DP	SECRETARIO ENOVE DE		

TARVATA D	FULL	HE	N L for Ac-	3301 11	F = 1.057	DP.	Also granted gr	KNOWLER	5 -
,	The second second		I constitute the same of		the But areas		and the second second second		

The second secon

Arrister and photographs are tested. For nucerial The Magazine nation of the state of the stat

In an latera to the editional and protogram or markets. that the site side on a timber as the of highlight me pared. years of field exick to analese their phied two

That beet site a six table to be feed above in have gone seed thank The second of th er and the same of and a public term of a property

The state of the s of some to engage a confidence of the Mayone of the property of the solution which the treat a Bose without, part in a 1840 and Care lathout, the is trelated by zon there into a new problems done stated for Promition and common a freed poster of the principle. Cadioo, previously missions,

where the recognition of the latter than the property of the parties. her the Nation is the grat less fractery and the U. S. Aprily. her I will, this world's largest hallow a Parkers II, was and a time wealth all deads record of 70 14 feet I Street W. Streets as I Capt. Orat. A. A. L. Lewen. trobact to the publicative property of the attended to proper ten die de Galeria constituite de la constituit de la con

The Sameouf Geographic Security II S. Navy Forms Ast 4) veloped in deerg Cauria I il i il i enterest to the enterest and other red the enterest page. the few mery here taken part at those presents to corresponding the little state.

The Socially consperned with Dr. Whitger desire in and the complete the translation of

the man are going to a contract of the first contract were thereby an just be the Associate, poster

One to the untild's largest a stelle and placed as steele turtede the palar regions with it no spred in Alaska and Yorkows by Breach and Wattles 1931 is hibe expounting for The

So of a send tim feathered from the of the physicist 1258.

Do you recognize your own mother?



4 - 5 - 1 - 1 - 1 - 1 - 1 s in a little like her property for the law of the second 1 shire transport of . \$100

THE TO THE LAND IN 15 | EXP (8 12') 40 - 571.50

hl - - 11 - 539.50 putter

BUST BUSINESS WOMAN. TOUNDER SVERT BAT, Do HOMEBODY, Long. COMMUNITY LEADER, I. Fred and the state of the state ty restrict or beautiful but researched by the restrict of the remarks by pay to appropriate and the section between the property of Territor are a sea to a resident kind at the or territor are or become the best to be a fine to the second we delicate the seal of head of head



Executive fields predect and the latest that the experience of a second contract of a second contract of the secon r prefact the report that the prefact of the rest of the prefact o hill in same a care of green motern fig. . It is the landon was transfer that a figure

"Whe-e-e-ew the New Super Chief!"



Just wait, cowledy, the year ride it!

The new Super Chief, all new from head-end to tail sign, will embody up-to-the-minute rail travel features, previding the utmost comfort in smooth admit speed.

The schedule will be new, too!

The Super Chief will depart from Change and Los Angeles overy day.

This fine all-fast-class streamliner will be one of a whole freet of new Santa Fe trains soon to be announced.

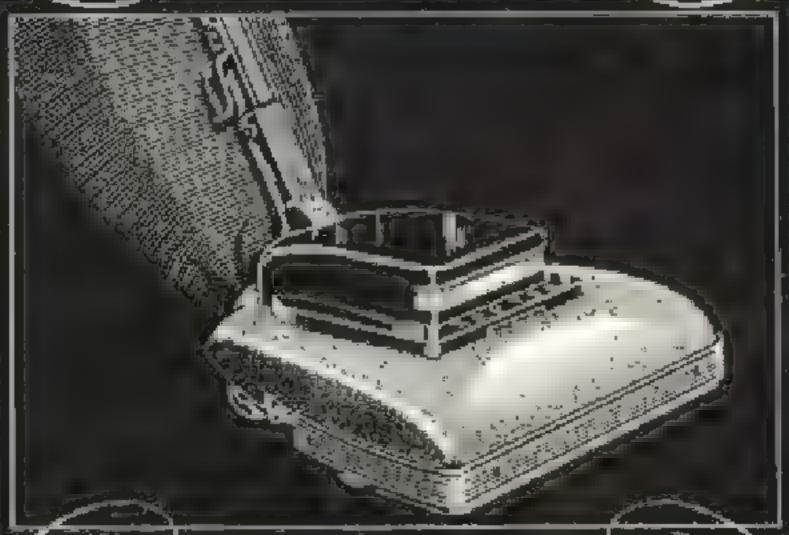


SANTA FE SYSTEM LINES., Serving the West and Southwest

7. B. Gotlahar, General Passenger Traffic Manager, Chicago 4



It Beats As It Sweeps As It Cleans



The Tinest
Hoover Cleaner
Ever Built

tigur Hoome Dealist is now ready to show that the new De Ame Hoome Cleaner, Madel & . example to with pleaning books (not silustrated).

THE HOOVER COMPANY, North Casses, Olin, Hamilton, Ontado, Cassele

Vacations Unlimited ... on Canada's Rail Trail

has been sent to be a sent on the sent of the front of the transfer to the first transfer that Cart de belock of the Attraction for the property of value - s to a fee se a contra to the contrata project to the for any the state of the state of the state of the state of Same I and the first the second





Interpretable to the formation of the state the contract that the state of the contract of the contract of the state of the sta I so I to the first the first to the first that the first that the second is the second to the second that the part and other to the



h (b i - b i - p) . .



2 MARTHAR PROVINCES PAIL SPAIL VACATIONS we that the Arm of New Yorks have lier (1) ke der « (4) Dir Programme and the A place to the property of ** 0.27 9 , 1 11 1 1 sqr to a grant of the same of the to the ct - il 1 1 1 1 1 1 1



A DAMASTAN CITIES SAIL TRAIL VACATIONS IN THE 19TH THE THE THE THE the literation of the state of the s spull and real Victor of let at the real of the king of Maria I a rat 4 . 1

Line 's and the same of the sa



At Home on the Range... and everywhere else

...THE WORLD'S SMARTEST,
FINEST PERFORMING PORTABLE RADIO!



Normal and selected Promoto make Portable with Long your promote that the will be a diff

the Market of the second for the period of the contract of the

The are in the five manual and stant a we begin to.

receive a constraint of the property of the constraint of the cons



TRANS-OCEANIC PORTABLE

ZENETH BADIO CORPORATION, CHICAGO 39, ILLIMOIS - 30 YEARS OF "NOW-104" IN RADIOMICS EXCLUSIVELY



Can you spot the stumbling block?

I have curit quare get the hong of the class members I () test that he have not been down as for a'- bet's a price man his dire.

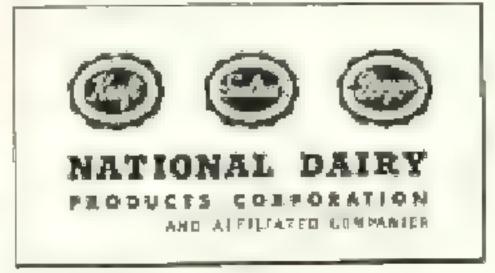
More the said inquery to be into the enting that the of most American challen, the parties while while where the many. But there are not too mater like labours, who go to solve their billion waters because and a him is their structures. It waters only break-tailed at all as

Fortification protes and more protests one large person to prove the horizon much leafur that has a second and substitute from the contract of the contract of

We set No tested Dancy know as by about that, for we are the case different kinds of a fewer alls and there are the rearry person of the constate and personal person of the constate are personally as and person of the constate are the constant of the constant are the constant of the constant are the constant of the c

The research has bedped die whole field of autenna like in the field accepts of a new on like our field start a till We cape the auten in the eyes procedured in a procedure listatic.

The lateral enotine and recovered better anti-constructions of days products in lancon front, we at lancon for the lancoparate of the products and must up by . In it senters it had and enduring property on the forms on the transfer of the lancoparate of the la





Times have changed

Old and my travellous in the South these days.

Modern factories rise but a struc's three from some of structor k character and tradition all along he distillusie Southern Railway System.

And there's a real endines

Business men who view the fature realistically have discovered that the



youd belief, with every factor favoring industrial growth and prosperity.

In this fastretserowing industrial area vould find new opportunity for your lineitness too... in these change it a times. A local you. Thook the ad--look South."

Emer E. Survey



SOUTHERN RAILWAY SYSTEM

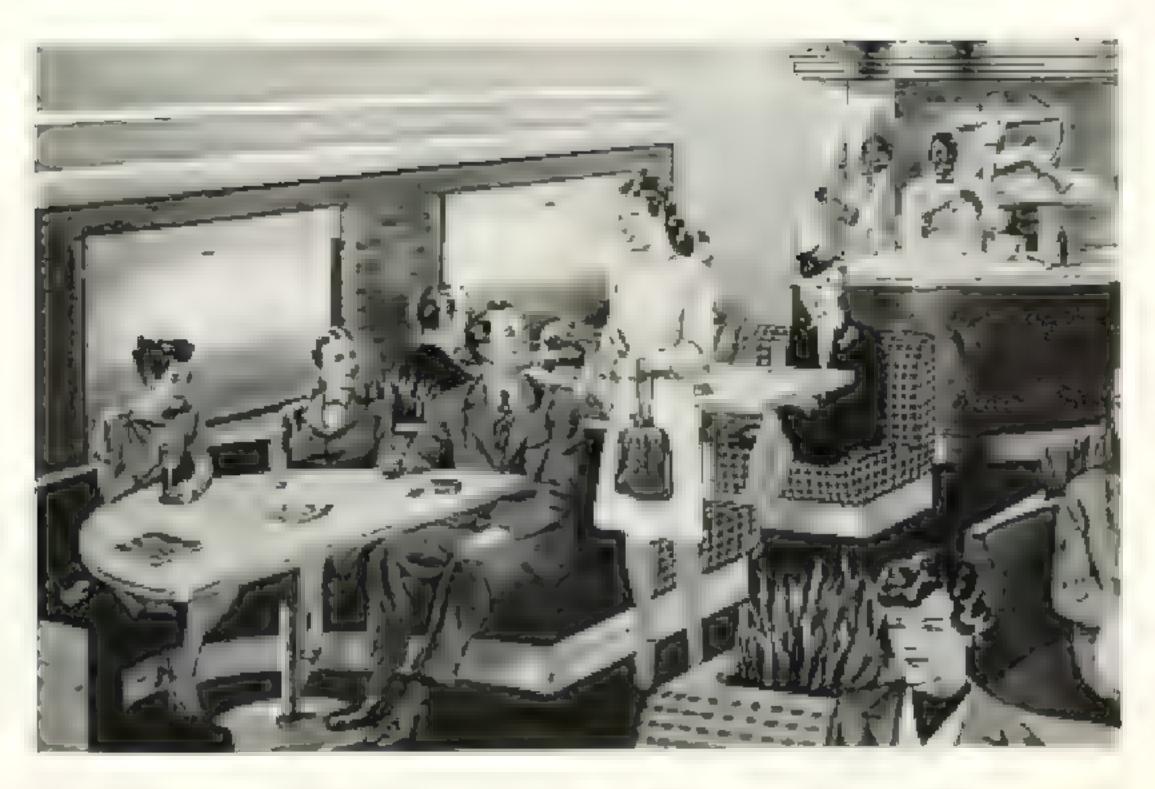
The Southern Serves the South

For the filles personal movies

Files camera, indeapor hiere ght is holdly to year the one Paraman in ag organization and throughout for and character from the first and the camera, and throughout of an interesting result in carriers, a lent and tale examind projectors and other equipment which combine ranged simplicary with refinements partered by the advanced surface that. Available for Some or 16 cm film. Every Files is a "Hurble 1" Bell & Howell Company, 7104 McComick Road, Chicago 43 111



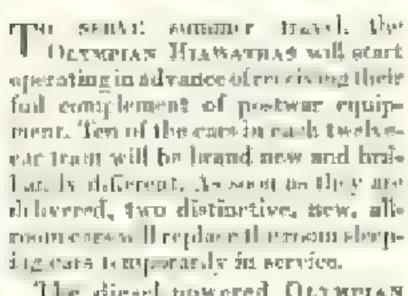




Timed for your most glorious Vacation ...

Olympian Hiawathas

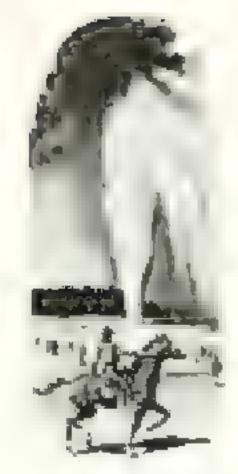
hetween Chicago and the Pacific Northwest



The diesel powered Octavitan Heavistias will offer must new advantages in luxury, economics, speed mid riding case. You'll cared your

rive sents: summer marel, they western variation by taking I'lle Mitwanker Road to Telloustone; the dude ranch country of Montana and Washington; the Grand Confee and Spokane laket are a, and the Scattle-Tacoma region with Mt. Rainier, Mt. Baker, the Olympe Personalit and other Paget Sound attractions.

> Fire Lacation Information Write teday for I terature on variations. on the Northwest Wonderland was the Orympias bliamaritas, newest member of the Spanishmer Best Address I. N. Harke, Pusser, er Truft e Manager, 706 LeLon Statem, Charage 6, 111









N. 4. 4. 1. 1.

The Witchery of Music... in all the gloss of natural cular tone with this superb FM AM radio-phonograph

theath, with the compaser, the music as he wrote that, with the arms the meh harmones and do now independ a interpretation. Revelon music arms in the rice without to hear it—all of it—with the bland harmone.

Whether any place and a recruinge a war dougle recrease to reacted a trainer of a company of the company of the

Interrupt to 151 programs on pen se Armeters of the start for all start in the cone Transporters at the sew to blee to be a second of the seco

tremation on his all tremations of the managed perfection of the the angular perfection of the angular performance.

To produce the Maradonae's maps in a cabacters, the work of Sheraran Charperd and a solution best modern de a terra in production was a short one of the world sector of the sector.

Now at tour Manager is reder, vio can see that the freeze of a new manager created and the transfer created and the transfer transfer to the transfer of the freeze transfer to the asking—en and some a fine transfer to the masking—en and some a fine transfer to the masking of the masking and the maski



the many beautiful error to many beautiful error to a training to a graph of the arror of th

GENERAL BELECTRIC

RADIO-PHONOGRAPHS





Out Where the Rest Begins!

You're out of the city now.

The second of the matter and the second process of the other parties and the second of the second of

Yes to cut where the real begins

Park your boad on the system and your cares in the cloud. You're serious and secure in your own Pakissan room,

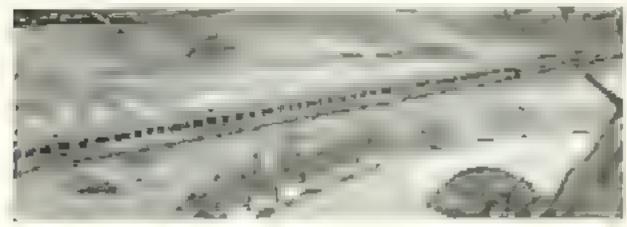
New for the limit between the parties. We not produce to the last the form of with others? Stip day, to the last to har market before you and other Politican possengues.

The same special property of the same special states and the same special states are special states are special states and the same special states are s

Peeling draway now? Watch that his 6-foot, 5-m is had all ten of all the wall! I have a transitional and a second and the contract of the cont

Comes the dawn—you're up with a clear need a year air-conditioned more lamps to furn't but sight, because you regulated it yourself. Present todat, work busin and towals are there. And lots of light for there ing at that big mirror on the cobinet door.

No mostler you look had you're stepping out of orthogo are what was a speak one from a Promise of the transport of the second of



NEW TYPE FLICIAN CARS are now to service on some represed that, now being built for others. Specieus drawing rooms, bedtooms with enclosed toilets, duples roomettes that rival the sort of a lower barth—these are among the accessedations that will give you even prester comfort what past "go Palliceis."



The most important watchmaking

development in over 200 years..!

Elgin's Dura Power Mainspring!

It eliminates the greatest single cause of watch trouble. And it delivers a steady flow of power for greater accuracy

When watches stop up tour the would when they upld the start we up or garpting a distant we up or garpting a distant we up or garpting a distant was been all of the current more research and a distant are distant as a distant was a distant and a distant are distant.

If ar, aptil gape the pay.

Let make a rings have been made of on less arents.

Ince up to D' of their faces of the pays of th

Heat resulting to transmitter for a sinon the race than, he may be at our comdense backer to the transfer of a
trader from a warm what to a cold a reface as a benut 's faced on a dresser
to at tacher, man care count the transport
a diffusion to learn spring.

POLITA WEN A . . . CHILLYOPES



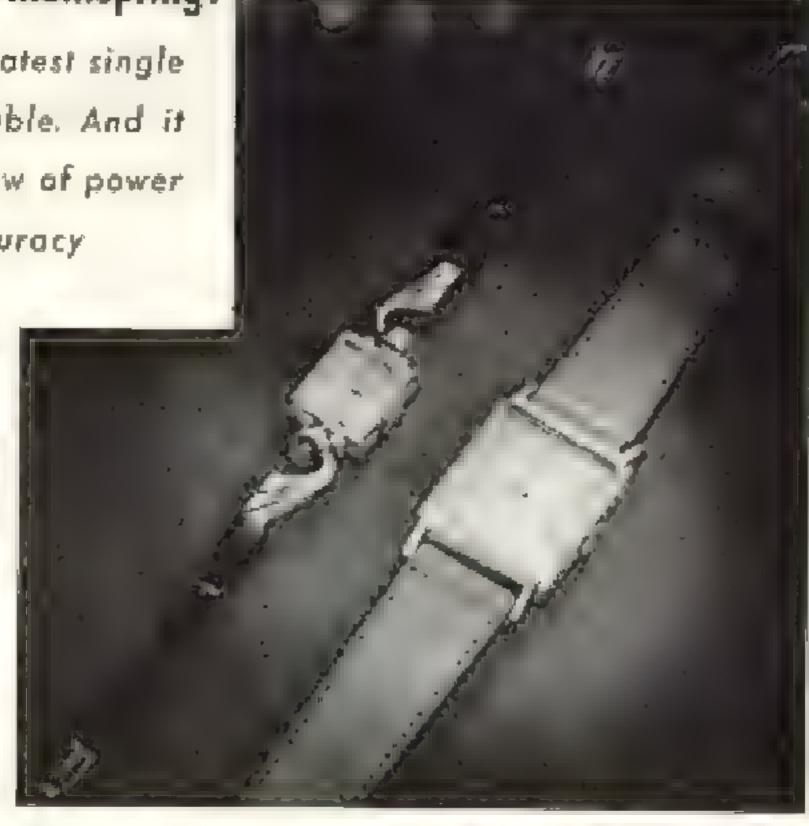
Lights distance gover Mains
species classicates
these causes of practice
species for the 11 so

to new or in of material developed for films to be it is not of material a general to a films of the films of

for the south fine is a format of the south to be a south



accepture of a fit day and the eighteen and



The works fight and have the first have the four two parts of the first and the second second to the second second to the second second to the second second

PERIORMANES ...

Continue of the continue of th

All the Leantif | mean Light at your description of the Prince Vicineposition.

SEE ORMANSTRATION AT BLEIM BRALER'S

A feet of Buttoppeng quality

in the world by the gas

source state lety to trake

fifth batt shops, was the

contractor, files, for other

facetal batt, for our for





to be but from at become was blick



for Free Illustrated Literature

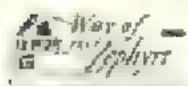
Tanch she would ever the and other single place will you not rect, a variety of Narray at Landau th Awe magning anyous! Special unit warms of Towering o nutrains and vagan breats! Surres of marray, general Bound's pools and mad when all to save and core, eds, anreligan See them all to saven men. America's and as versure has your.

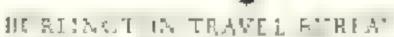
Your Choice of 3 Routes When You "GO BURLINGTON"

The North Court Limited takes your from Charact description be however the part of the first type that starting the first test to part to the first trong the day of the day

Heles Or go by way of Colorful Colorado, to treg the structure of the Structure of the Structure, is to seen a trade-replaced Departs of Colorado, Springs as points which the Go Bubble 108 1 Go can way treat translate.

- You'll empty linearous air-consiture of the characters any of the characters. Actuated the provention of the Colly Road, at no managery, when you Cold Marabott S.
- Malthe grap, it aday for complete in a continuous or Magazinal laborations of Magazinal laborations of its action with the perfect of the p





Days of Later W. January Bad , Consco & Minos

Les allestes de la company en Magaza de la lorde de la company de la com

Name

dal reso

City Zine Sign





Do people like to come to your house?...

If you have a lame where people like to come . . . you and your bushand ought to tal via manner! to salute each other. You're gard jumper And vot to the first trainer that others enjoy Character to the series and the state of the control of the series and the series are the series and the series are the series and the series are the series listing music. You have a become a section, that Steam berg-Carlson has built its reputation as to a new part -I wasten glit it because you wanted flavels on a gdotal Minol to Latest a leanners in radio and record representation. You have, but it because you know aighing endd contribute none towards making and the appace where you like to be, and others like to come

MEAUTOGRAPH, TA STROMBLEG-CARLSON BADIO PHONOGRAPH DUALITY ENFOISTINGTION MOOIL 1135 FL.



For the main radio in your home . . .

THERE IS NOTHING FINER THAN A STROMBERG-CARLSON



THE ORAC TUS DECESTANT

THE AMAZING EYNAVOM ()

THE CHARM NO "EALEM CHEST

The or I'm I was I be good, the search of the a the restriction of the state of the state

Street Company Ladge, And a Phinagraphy by the an - Saust Equipment & Technical - To-aphones, Switches, daily attraction and an Systems.



Weather changeable inside this car!

() The part of the carrier of the said theorem.

The second to be a second to a pitch of the second to the

So and in a produce it is to be to confully a party of the contract of the feet to be to be war. I specified the to be war. I specified to the best of the base of the best of

the WHAT appears on the compare a set of a contract the c

to 4.0.1 in a company of the discussion and an angle of sound;

For the consumer, there's first, sore delivery, in bottom in alitant, of an area's.

For the shapper, there's dependability, economy, and the assurance of satisfied customers of the other cut.

And for the carrier company limit, there's the efficiency and long life that mean exceptional service at the lowest cost per mile.

AMERICAN CAR AND FOUNDRY COMPANY

ew York * Chicago * St. Lega Clave and * Weshington * Philadelphia Parabargh * Son Frontino





THE HENRI STERN WATCH AGENCY, INC. (Universal Ganave Division) 587 Fifth Avenue, New York 37, N. T.

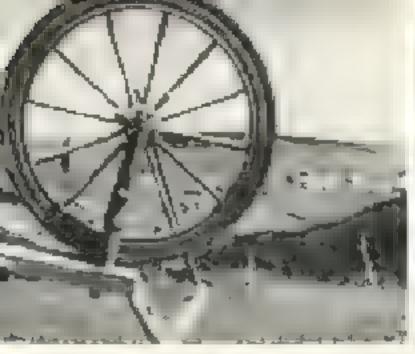
Montrent, Canado . Sunnen, Smitgerägnd

this road, the feet his bell Astronia Co.





		ust fe			Ç-¢			
		t esu F			53/4	FL N° .		
NA.	ME							
5 1 R	££1							
CIT	Υ			5147				
361	1 M 1 84	o Feir	HE-A	TLA	u Taq	⊳¢o.	a st c	



Old crafts, old customs and prevency to travel in the Eastern provinces.



Sun, swim and sail at one of Carada s away-frametrail take calonies.



Canada's coasts and island waterways layer you to long, lary bours on dack,

IT CAN STILL BE ALL YOURS THIS YEAR

the cool green spaces of Canada's varation playgrounds...
the life and colour of ber cities and resorts... the refreshingly different flavour of this neighbour nation where you're never a stranger—always a guest.

But better harry and make those reservations. If we can help with information, send the coupon below to Canadian Government Travel Bareau, Department of Trade and Commerce.

Ham & ALMORENINON As all to p tan botan Orang



NO PASSPORT NINDED





For the property Harris I to the fact of the I will want to the grant of the and the sale to the late. of the earthy transfer of the same 1 12

They've is not be bound to the temporary and rest to the first of the state the distribution of the state o

Soo Year Evineada Danner - 1. de f. la testile in visit de operation and de manda en

EVINRUDE CATALOG FR

11 4 3 11 4 5 4 4 7 31 Bridge 2 4 Bright

4 A CHARLES TO THE PARTY OF THE To the state of



20/11/11/11

FIRST IN OUTBOARDS — 38TH YEAR

Fine Stationery AT A BIG SAVING



Before of mattle Paper Stigning

The four statements is used by the earlie of Smooth Granita Takes, 141 1 garite as the man of the for party, was to provide the fitted. All the title per a self-walls we as in the mail in service. mini ha mar mika Cara canastal land san Try park or Serlenis Still (Wester little user, folia, and is 1', S. Pieter ep., not 11 to 19

THE AMERICAN S ATTONERY CO. THE PARK AND SEE PERS, INDIANA

FT long at a above or 1 km re-rio sec. Printed with a countract of the Level pagamata beard para transpara 5900

AMERICAN STATIONERY

"The Much for a Little"



en particular de la constant de la c

The Picture Tube that brought "life" to television

The resolvent before pelebical the end of the end of the fair of a large porture tules, should the skater that their section the fair of the parties of the

Propose and received parents and the development of the development of

An BCA Victor television re-

deams and excitement that you'd cures of very were at the event of parameter and on top of that it's after agent to you is the equators of your own home... well don't have to the reservence.

The restaurance of the street proother restaurance of the street, in a rest that we be about the remark of beautype that we be when the remark or beautype that we be about a market to a value. The tenant \$10.5 % plant

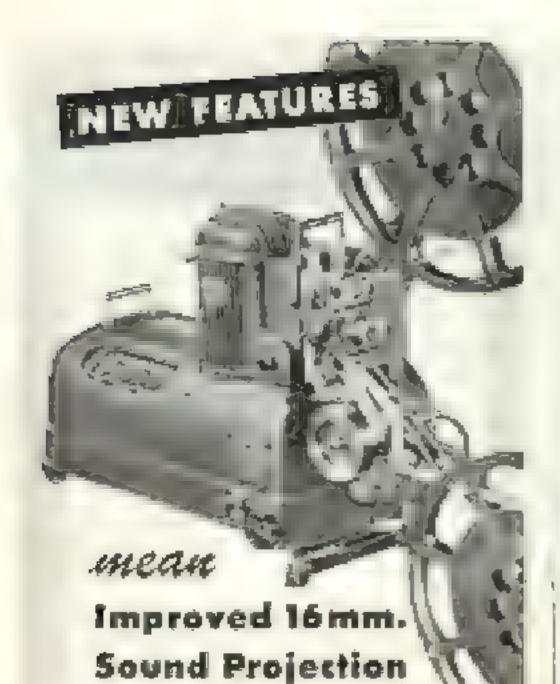
Rad Common & function, told the Administration of the Administrati



I velagative "ham whitelete" for there is all lotal, herefor having the result of the first of the part of the whiteleters, where the constant, where the constant,



RADIO CORPORATION of AMERICA



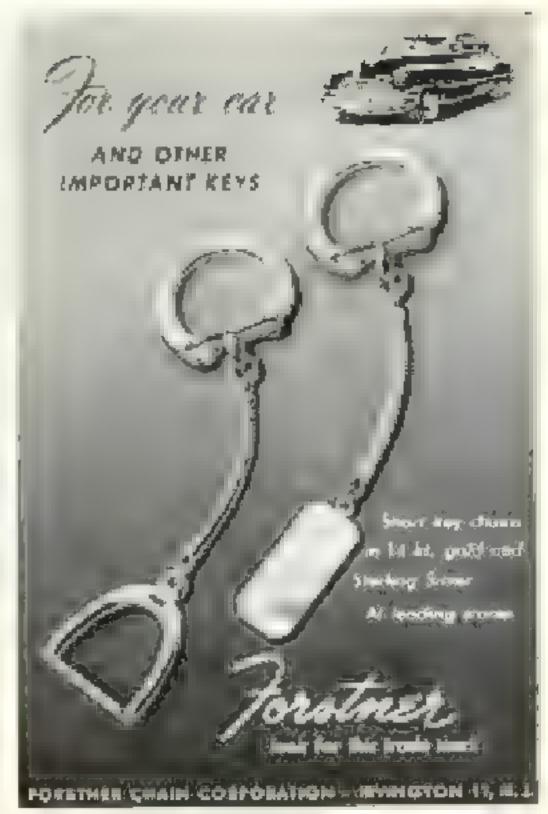
Basic improvements and advanced Jesign of this new "Premiee-20" 16mm. Ampro sound projector set. how standards of convenience and efficiency of operation. The new saving-ent-gate permits the inspection and cleaning of aperture place. and pressure shoe ... without ever disturbing lets focus. New dynamic production wide congressed a beginner. privace the continued passing said. eachly finished as simulated leather. are wratch resistant, loffer complete protection for equipment. Matery other special Ampro features of this ' Premier-20" bring new theil s, and enjoyment to all 16 mm. tound projection

> Write today for complete is tally out force on the "OL am Property on and

AMPRO CORPORATION 2835 M. Western - Chicago 18, Mineix



A Gangeal Provincen Lautement Sabirdiney.





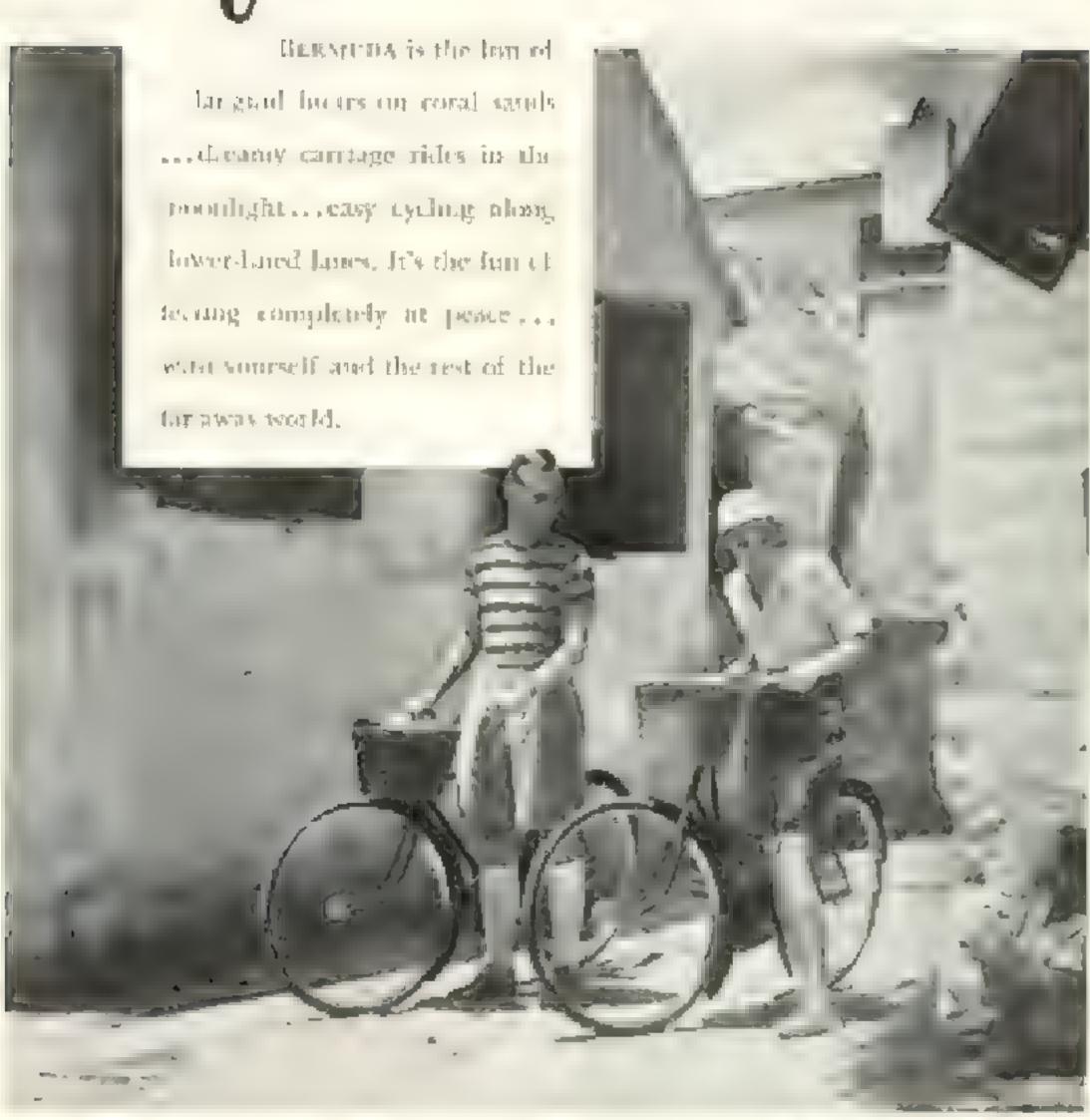
These Hampshore - Inspector for figuretty from the security, resemble to a Ex Solve High half his size of the stream and apply स्पार्त तहरूक्तक को संस्थान का अस्ति है। विकास का अस्ति की स् and seem that I then I'm of a course will give to abut the seriann and relative, we come to give, so with great per cost rating in the craim from thoragon Misses benefit of the diam'r.

by New York with the N. H. Information Server, 10 Recentation Place

sing in and brooks, a stances of

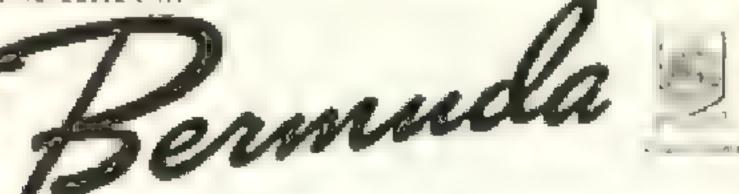
on to the how he was on he will enter gravat exemp, many a class of adopt to the mone

Out Fin!



EVERYTHING IS BETTER IN

CLOS MAND A LANEL ST. GALDEN.



IOR NIW 1311 STRATED BOOKIET, as the The Bermada Tend of the control of the contr





THE WORLD'S LARGEST COLLECTION OF

Oriental Rugs

The Natural Broduct and imported, build said theory of the Your states of imported, build said theory of the Your states from every type collectors general rooms states, large or small mass, regular or rare dementions, and a vast array of colors has may have an admittent on approval the source states morded and color preferences.

Calerful hook "Rug Boostiful" and special catalogs -25c

Nahigian Brothers, Inc.

149 North Walsach Avenue, Sept. 2 . Chicogo 1, DL

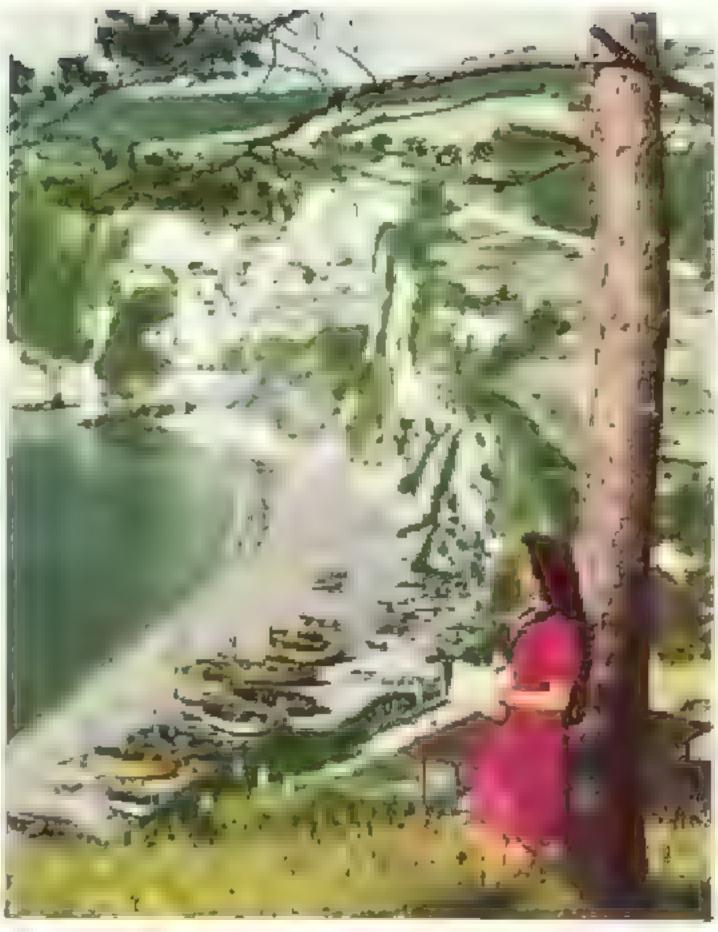


Food is excellent in Switzerland

ii depend on the same of the sam



You feel like royally and some





II DELLARD DESCRIPTION RESERVANT TRANSPORT FOR ESTADOL NOTE BUTCHE FILMER Y





Paris - Montmortre | 1000

thate convenient connector of a largert

by the largert for the largert

by the largert for the largert

(Ukana be

Maybe you've done a lot of traveling... But don't compare any trip you've ever ande with a trip by Clipper! Because here's what will greet you at New York when you ify by Pan American World Airways...

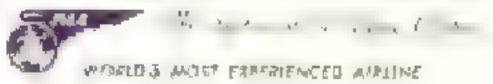
Men and written who know as it is he ... Mer and women who belong to the only radion

to the needly which has logger over a fall a laltion intes of circum overseas thight

0 0 1

See your Travel Agent or the nearest Fun American offices a national reservations to Fu ope or to Latin America —Africa—the Near Fast— Alaska-Hawari New Zealand —A istrolia—and the Orlead

PAN AMERICAN WORLD AIRWAYS





Whether you are seeking an around the your land to the section for a pleasant place for a family vacation ... the State of Missouri has much to offer.

Business advantages: A new constitution favoring industry Low paxes. Adequate well-rapply, An abundance of labor, bacelleng transportation, Rach prackets, Low-cost power. A wealth of natural research.

For Breakly marked to you farought. All our and

Manual Days on a Cheodrees and Development, Organ Days for a few of the last o

млп

C 11



Yes the deal complete for jost camera, a therefore a training or make the line of the compact Western Papers to Monar for every text and hong back but make the line, correctly or passed partners. See it at your dealer's today, or write. Western Paperson Introduced Corp and For long-tay sending, Newscript, J.

WESTON

EXPOSURE METER

THE METER MOST SHOTOGRAPHERS US

"COME TO BRITAIN"

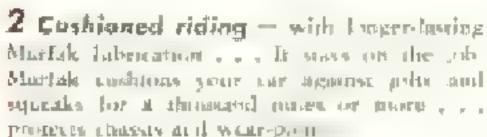
EDINEURGH 24 AUG. - 13 SEPT

The International Festival of Music and Drama

telemelebeneme Opera (Veedi, Mozart): Ord Vie Theatre Company: Compagnie Jouvet. Peres: Smiler! Wells Ballet: British and Love gu Orchestras incl. Vienna Philhacmucie. Orchestre Colonne: Confectors. Brand Walter, Paray, Borbirolli, Surgent, Szell, Sasskand, Lin Whete: Soluists and Chamber Mosic: Lotte Lehmann, Schnaliel, Szigen, Fournice, Printose, Katalem Letrer, Peter Peers, Total Dancars, etc.

fra fire f direct

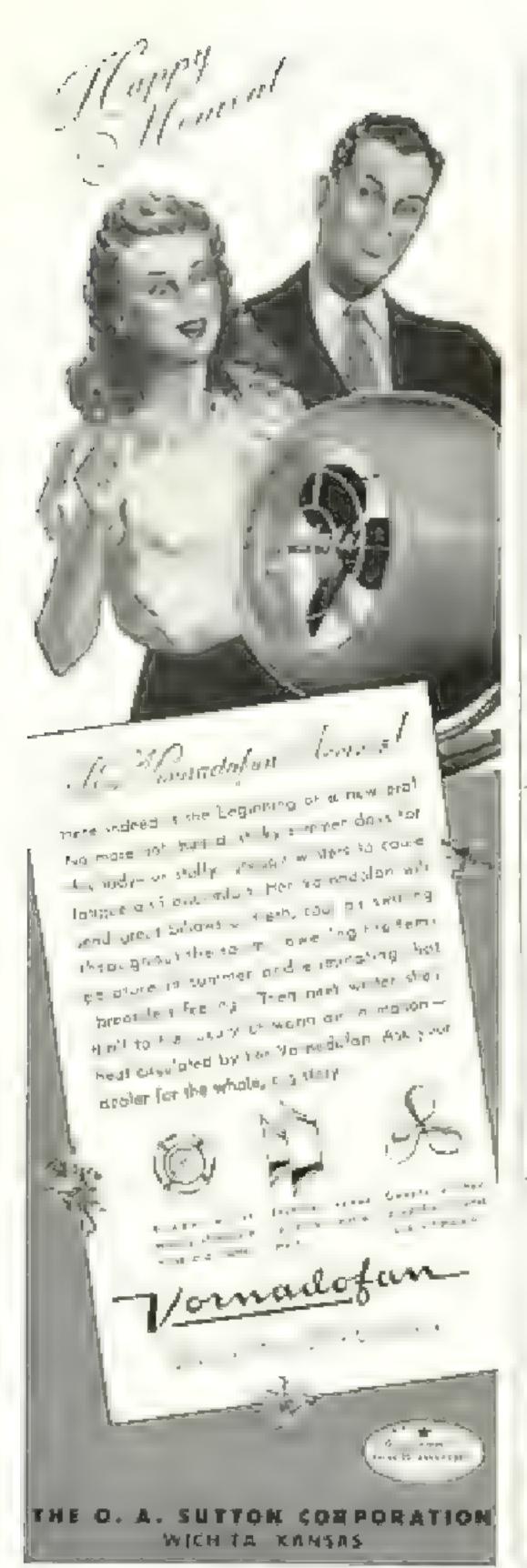




3 Smooth shifting — give comb pears the bull protection of the proper seasonal grade of from a transmission and differential information Sections Texas of Deuter to day.

THE TEXAS COMPANY TEXACO DEALERS IN ALL 48 STATES







Treat your whole family to a vacation in Queboc—where the chaim of past contuties still langues beside the most modern highways. A French Canadian welcome award you're Québoc's modern mos and botals. For maps and booklein write PROVINCE OF QUEBIC TOURIST BUREAU, Québoc City, Canada.





In the Heart of the Health Country

Thomands of people want to move to the wooderful year-round, mate at Athuquerque, and we have prepared they want to exchange to help paciplan—because there are no accommodate to a available perfered for the rechoolate today, and plan to come later.

ALAUQUERQUE CIVIC COUNCIL



Streamliners and Dreamliners...

Headliners in New York Central's 1947 Luxury Parade!





New Days of Delight

Still and the Control of the State of the St



New Dream Trips by Night

Fig. 12 he product of one one of the Constitution of the Constitut

State of the Ball of a west



YORK CENTRAL
The Winter Level Route - You Con Street



A drive with beauty...that never ends

SIMONIZ GIVES YOUR CAN LONGER LASTING GLAMOUR

It's was to SIMONIZ yout car while the fourth is still now the telling what's absording by must, roud grave search tot, other to also have them for the part of the finish. It also that you off ight by mark of that new fourth aven more boostile—that the first properties the first part of the first conditions that have a suppliedly must be the first to appear that be able to excep your car that began decides, you'll be able to excep your car that began the spacer your car i Simonized the better. Do it right away!

TO DESTONE NEW BRANTY IS dol-

Final And Share and The Company of t

[] Ma QU | Fare . At 141



Motorists Wise Simoniz



DAD'S LOTS MORE FUN SINGE HE GOT THAT WESTERN ELECTRIC HEARING AID!



There is a difference in Hearing Alds

• Western I lectric Hearing Airs are made by the national arest producer of communications and are such regularity. The first of material area are as a least to be the famous to 3 to be destructured.

So, Wester II or responsible to a major state of the stat

Wes.	tern E	leci	ric	
Dept 380-M4,				_
la galker	for anyly t	= len	ह के प्रदा	på sei g
V 12				
1				
<u>↓</u> 1	*	4-1	-1	_
ing the second s	·			ete trans

health! But remember, appetite and taste are not always the best guides to a good diet. Neither is cost, for some families that spend a lot on food are not as well nourished as those who spend less—but choose more wisely.

Today, medical science is using food to help in fighting certain physical conditions, such as diabetes, overweight, and high blood pressure. Eating the right amount of the right foods every day can mean better health.

- de for you!

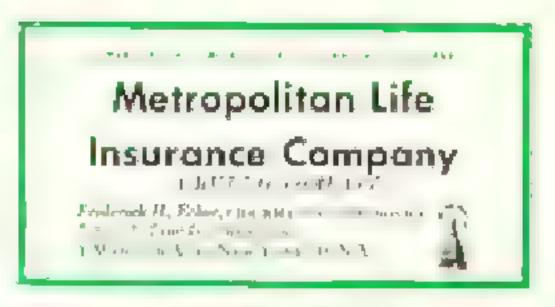
Choose foods to meet the body's needs!

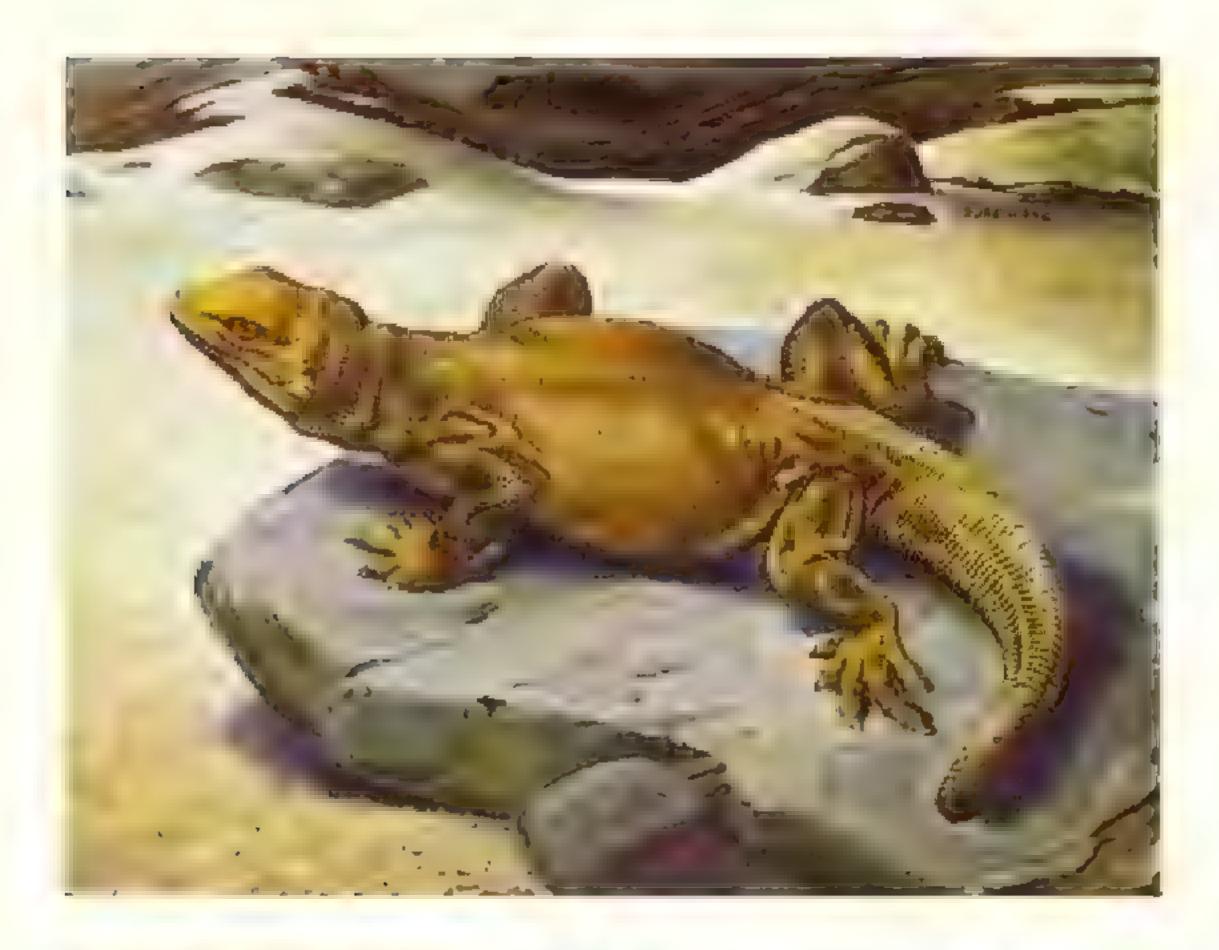
peaceful at mosphere is helpful to good digestion.

to of particles of the state of Matrice and a second section of Matrice and Section 1988 (1988).

Daily toward the rate of each point of the original field of positions with the field of the fie

When and how you eat are nearly comportant as what you cut. Have your meals at regular topes. Eat them slowey and enjoy them—for a largey,





Why Chuckwalla wears a slack suit

T - 11 * 2 10 1 kid s a k 2 3

It is the best beauty. The rough, as here is the form a many a complete the source of the base of the second state of the second state of the base of the second state of the base of the second state of the second state

When the same bath on a bond or and a long of the stratest ledge to a section of the stratest ledge to a section of the stratest ledge to a section of the s

into trouble Jespite his best pre indica-

He does that the control of a linear street and the street and the street and the street and the street.

Rup it in a your house and its contents correction, our own—is true valuable than ever And trouble conting your way, like an intomobile smash up or an accident that lays you an, stands to cost you more than a

So isn't it a good time to theck up on your and the oil, the life of the your law count oil to oil, the life

Your location ignores the best will be gladed as a province of a literature today.

MORALI INSURE IN

The Travelers

ALL FORMS OF INSURANCE AND SURETY BONDS

The Fravelers Insurance Company, The Travelers Indemnity Company, The Travelers I de Insurance Company, the Charter Oak Sire Insurance Company, Hartford, Coursest cut.



Office lunch... Have a Coke

To the federal and on the contract of the work, it is not a second of the contract of the cont

Coxe = Coya-Coly

" Constitution of the adjustment of the state of the second of the secon

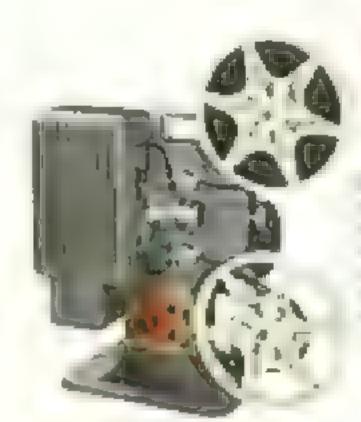




Ciné-Kodak makes home movies easy as Snapshots!

Now there or, kind a section suddely used servorus in was carriers. Citie-Kodasc Magnitude 8—show a crowden base a fast / 1,9 Landard lens of the ice wonden tapes of the annual parties. There is that in a lifty with full-color and back and white film magazines. Price. \$125 Other Citie wordsky from \$50, Tax extra. Available in increasing chant ties.

RODAK & COMPLETE MOVIE SERVICE



He away Eigh-33

tasy to car



EVERYBODY NEEDS & VACATION - EVERY YEAR

In Maine ... you can have whatever kind you desire

What do you prefer? Pleasure boning? You'll find our inland takes and seacoast unsurpassed for sailing, our canosing waters the finest in the East. Do you want to summer on the shore? Our beacase are among the mest famous and the Atlanta. Can't Or do you like to hat, camp, rice hike, climb mountains? Maine has every form of outdoor sport.

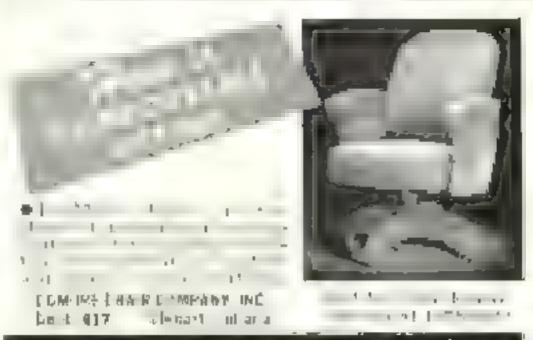
Whatever you do wherever you stay, Maine class anapiring scenery, a delightful summer characte, farm dresh foods and delicious seafare, your choice of living accommodations, and friendly, "Down East" hospitality.



The cettle voice to 1.74/
variation place to 1.1 year home stations to 1.1 in large.
Lee book

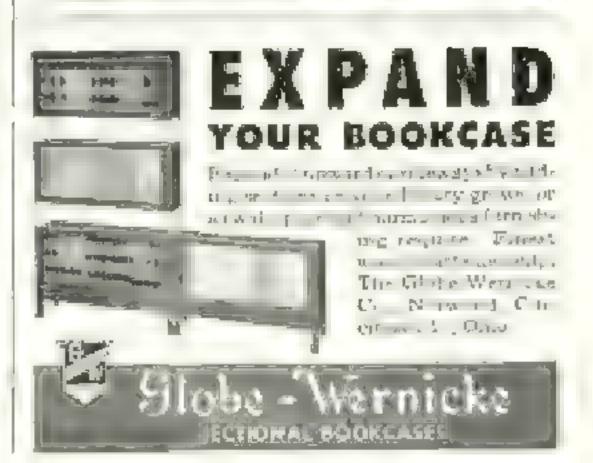






SOLD AT BANKS AND PRINCIPAL

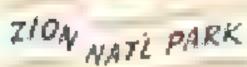
DOMORE Chairs



Union Pacific Presents

A Star Feature



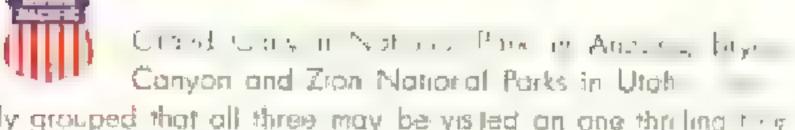






TRAIN

TRAVEL COMFORT



closely grouped that all three may be visited on one thriling the comprise one of the world's greatest scenic attractions

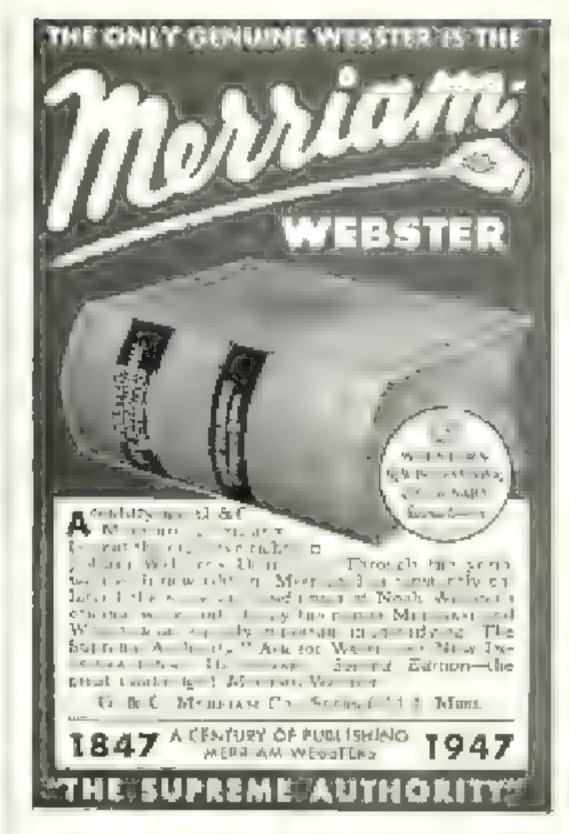
Magnificent in natural formations, brilliant in color, these regions offer vacationists on unpara elea experience.

As a fourth attract or there is the encyment of traveling in almond and conditioned comfort—by Union Pacific. Complete relaxation at the way.

I de red trais ait in Utar-Anataro Natural factor by a visit as a "stop-over" entoute to or from Cobiomia







COME SEE AND FEEL

Section to the section of the sectio

White grams are common to the supplier of the

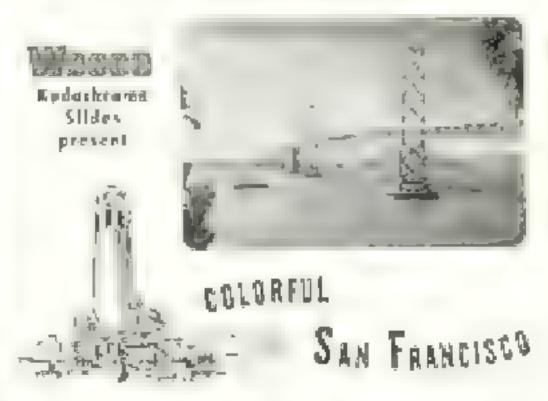
Care and a section of the section of

I was to be a factor of the state of the sta



Panniylvania Department of Comments





City of partry and agend, we see E. I meets West. See we what or given a part to the following a to the Greeken Government to the control of the control of

At barrier agmera shares energy bare

-	SC50 TOOM	744 FEG	177 02 107) 5 (107 (1	MOREN	Berleis.	-1
	MAME						1
	ADDRES.						į
	<u> </u>	Western Reserve	i Marin Sup ich Aldg "Se	gelpritari op hiseri	0 1000 P	r _{est a}	1
-							



gur 18 at Monnigabil bee



FINE OF MARIE ASSERBITIONS INC. • C 404017 JPLOS SA 3 DE JOS STATE MILOS ANADOS MARIORI 11 N. 4 HORS DE CASA MARIE PASSANON.



Used Exclusively By

Chandle Aces in Land and Parmittelian for a tracker Serge Known it by Go and I am by the form of the series I am by the series of the series

Baldwin with the contract

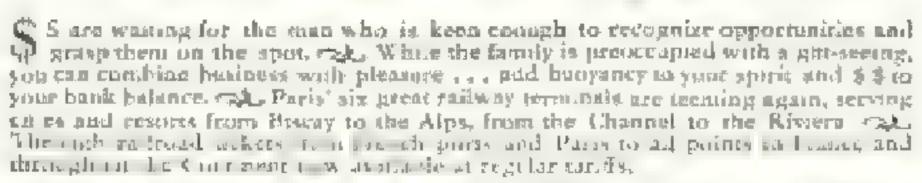
PRINCIPLE OF EALDY IN ACROSON C. HAWLETON ARE RUMARD PLANUS.

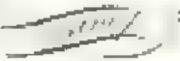
Parned Distinction

Public and celtical acclaims in concert halfs, achoose, motion pactures and radio... generations of match-less beauty and performance in houses the world over ... superb workmapplip made upsform by securities production control.

The same that it is not all most in the Distinction which 85 years of patient emission have earned for the Buldwin-Today's Great Punc.

HAVE YOUR FAMILY ENJOY FRANCE WHILE YOU SURVEY CONTINENTAL MARKETS





FRENCH NATIONAL NAILROADS, 610 Fifth Avenue, New York



For Effective Mouth Cleansing

Mouth care is a habit; Mouth health the result.

YOUR SUMMER VACATION CAN INCLUDE ALL THIS IN

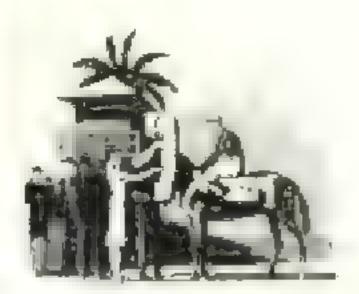
Southern California



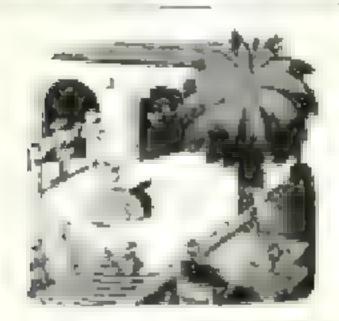
PACIFIC OCEAN—(notes | Louis)
begins at a companio, where to easily
to substitute points at the substitute of the substi



ARIGHT LIGHTS—Symplemates Under the Stars..., may is low I clubs where you'll dine and dance and see famous people



MAJOR SPORTS EVENTS—highway tuces at parklake tradturns tuces at parklake tradtuces at parklake tradtuces, decreased extens.



cal alteres, case in granulas...

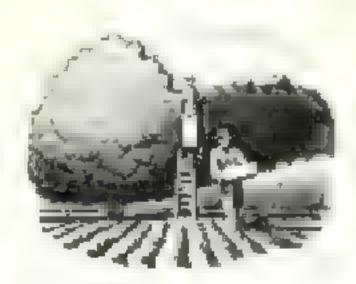


MOUNTAINS—I place at 1 1.5.5.

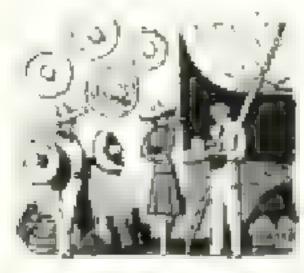
The bear of eligible and the term

to deep limit laborate at the term

to a sering to the term



ORANGE GROVES - released in a large ly maio of chaptel. The state of the large ly and we have large ly a large ly and the lar



POREIGN QUARTERS cut with a competition of Control with a competition of the markets, given between at the Manner of the Manner



YOUR OWN BRAND OF FUN
to him exertities enjoy it bere in a
defractit corresponds i servere
where the sum is a lifety and
mades are read

Francis of an art of the second of the course of the second of the course of the second of the course of the second of the secon

FREE POLDEN ... MAIL COUPON TODAY!

scores of other things to be and see in the tradeless the hundreds of attractions in Los Angeles County stal all Southern Cablumba Send to the professional and the county at the county

In Lor Angeles, visit our All-Year Clab Visitors Puteau, 517 West 6th Street, for free factor's vacation service and complete information

Y Your Chalmat Service of the Servic	1.07 (*d *u (* 4 2.1 () d) 1015 1.5 *M (**********************************	
	_	

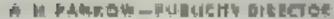
Stability of the Annah Sept.

EXPLORE THE

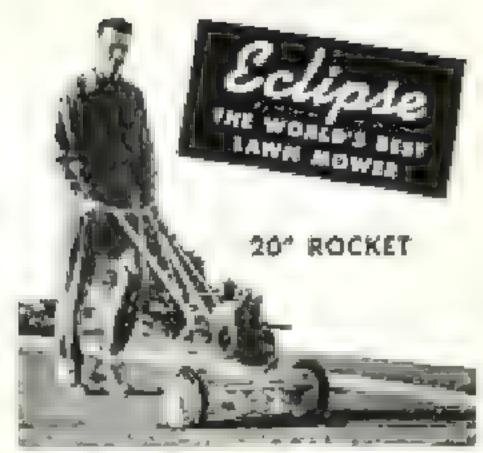
Third is the warmower of Name of the special is the source of Name of the special party. Hadden of Margaria, we see the for exercise of the same of th

Also in Nurthmore, I more from Parkand the Back Hill tafford a trends wonderturble raceye amy rath on Outdoor funar I wesseen a servitar director will make your I ack Hill a rather a pressure of pleasure to less sings Nothings for other

Wa'll be looking for you







WILL YOUR NEW POWER MOWER HAVE



18 M t.R driven wheels
19 W. M. H. Liver and C.
29 W. R. Street and C.
E. Liver and C.
E. Live

Taradian management to a

The Eclipse Lawn Mawer Co. Prochardown III.

HAND AND POWER MODELS



Judd & Detweiler, Inc.

restablished in 1656.

Printers

INTERNATION MALE AND HERE & A wife

2000 1 1 1 1

THE THE BOTH HE WILLIAM





Victor's new "60"—streamlined in design, refined in performance. Truly a triumph in 16 mm sound motion picture equipment—for schools, churches, nome and industry

VICTOR ANIMATOGRAPH CORPORATION

A DIVERSA OF CLERKS WHIGHT CORPORATION

Hame Office and Foctory: Dawsport, Jawa

Name York in Charage

12 stederiors Phrasima hitte World

MARIAS OF MOVIE EQUIPMENT NEED IN



It's Spring Again In North Carolina

LEAVE presuments weather behind, ... come where the blackinds and robust are imaging, where distocals, crocur, red bid and for sythic proclaim the nursale of spring, .. and however of dogwood and wild benevates a make every scene as well. I have an introduction will be a successful and the glory of a make or in a main

Procedure of the secondary of the second

From Mayle Travelogue in full Color Available to Chape and Coro Engandations.

The state of the s

*r

The National Geographic's TEN-COLOR MAPS

Keep Pace with World Events

ACCURATE, timely maps are essential to well-informed men and women, to milente and teachers, and to all others who are cager to understand the geographic factors that instituence vital would developments. Because the National Geographic Society's spelling is followed by major press associations, all place names in today's name are easily found on these legible, large-scale, ten-color charts. • MAP INDEXES, available for maps marked with an asterisk (*) in addriblank below, make casy the location of names on corresponding maps, and describe areas covered, • In the ten pockets of the 7-4 x 104-single MAP FILE can be put 20 folded judger maps, or 10 folded futer maps with Indexes.

The that accept point Spore of D. C. 1985					
Please send ma items spill		N THE			
			Hames I		
Sandard offer maps come on a dist paper of			Frault to i		
hung, "In . ruce are avail-		Lance	ic.derps		
able for Maps marked	80cm		dae		
with astroiaid Ad dean	A 11 F	4	1.4		
ata mend pools po grapa	7.3	21.72	50 m		
Aárica?					
Ar cr 1 July			I		
Asia and A statement /			-		
houses Ore .			6		
· Lames					
A Carlon Con					
wadata.					
Character					
Carry Glan at Mear					
B & W Memorahayan			E.		
Едгора в Мифінтичний	1				
Luscoe as 1 % at most					
Except up I Near Start					
to booke and at the control					
Contrat Fortoss & Medic 1					
Iterator of Was as Europe.					
Cermany & Appropriate.					
ledin & Burner					
In hing Oceans			,		
apole & all mount Pegiona			- 1		
if Ant & Paris, Oceans					
Janan & Koren ka doma '					
Mes. Can Am. A W 14					
North America"					
Fa & Sa Hamigharer's					
Pacific & Buy of Rengal*					
K Carrier					
M- puntor					
SOLES AMELICAL		ab .			
Senger of Asia					
The World'					
BESK Hem.					
Spired bates - Lei C.					
Jasted States—1940* "Forthead Douted States"					
Dorthwell Could States					
Southeast United States			*		
Sensit month is not between					
1 P 1 P 2 P 22 1 A P	h 11 4550 B	ин. Рарег ин			
F PER SER LEGISLA	- 1	7-2-1-2-4			
San captes of Map relevan	CH 80 to 11 y	t Property of	51.72		
			7.6		

WESTE DAME AND ADDRESS IN MARCHY DELOW.



7 - 1 Taple 8 - 1 Let 2 Set 1 3 1 Let 2 Le

DO BY INDIST A CONSTRUCTION

209 State comme blide

Nasjer die Parenceres



CHICAGO ROLLER SKATE CO.
World's Grantest Railer Shales for abor 45 years
1408 W. Line St., Chicago 24, 3L.





You'd call this new lichtone Monn-Par Rearing And a miracle, too, if you had been wearing a clamay, annoying, hattery pack strapped to your looky with entangling water, and then suddedly found the new Electronic Beltone. It's a single unit hearing aid—so small you can hide it with the palm of your hand—so light you forget you are wearing it—so thin it is not it musight—so that ent you hear hand—so then it is not it musight—so that

Those are a few of the reasons why more people are wearing Baltones than all other one-unit hearing side combined.



COLLEGES FOR WOMEN

CHRISTIAN COLLEGE Accounts of the and the appearance likely disposed. Landendell trace-

to a la la la la la nec C. Meter, Ph. D., Fran. Box D, Colombia, Ma.

LINDENWOOD COLLEGE 🖟 🕆

A ...

Provident, Ben 247, 52, Charles, Minesart

MARYWOOD COLLEGE

the instance measurement in the Alleger and higher than the maketing forms held Marrierod Goffege, Ben II. Bengerse, Pa-

CO-ED COLLEGES

whitehes, amid-lated opand the state of t Contar Majoria was

GIRLS' SCHOOLS

M. Spect H & Cree , Bun H Charmacon 1 9 5 5

t. Dangtha, to

CHAPIL HILL SCHOOL

Bobert C. Haunds, Print and Waltham, Mosa

DEAN JUNIOR COLLEGE

. Upbert he a anchemical-up climat malegories. However, tute W B Garger Provident franklin, Mart.

EDGEWOOD PARK Arene 1182 () A Burn be, Meine guret Manage W. T. erit.

ERSKINE Two-Tulk compre for dury stell Mes Sans The same of the Young. & restur 125 Leaves Street,

Boston Massachusatte.

FAIRFAX HALL a P top a the Arts. In position's known the management of the second state of the seco Prop. Bun Bed, Paris Irlabben, Megana-apara, b'a.

GREENSRIER COLLEGE THE STATE the other appropriate the contract of the cont and the Maria, Proposite Art. e 5 B a 1 C Promob W. Taperparent Press, Day t. N.S., Lew steing, W. Vel-

GREER SCHOOL Appropriate College repaired and demonral Contract for pixts 13-11. Maint, Act, Typ eliter he was ametrem mental street f on C firler Dr., Bor 44.8km og nm.P4.

KINGSWOOD-CRANBROOK ADVENTURE TRAILS 4 1 ...

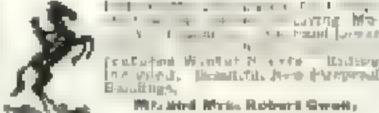
other appears, typing the preparity 126 Cranbenes Band, Stowerliett Hille, Mich.

LASELL JUNIOR COLLEGE

as we see that the plant of the t plot | Lynn n n n n n e 16 W 1 1 11 · sambur From Sup M. W. Strate, in Part 11 1 1 1 1 1 Proc., 321 Woodland St. Antoroxists West, L. Co. Reigh | Bours Dun S F D., Lewes, Oak Rehert Smith, Res Willoyd, Perspectation of

LINDEN HALL , ,

F W Spargal D. D., Haz 4-4, Schelb, Fa-



Y I will Y I PRINT WITH fentufent Wimfut & erte ne oriest. Dismitatila from françoisal. Beautifugs,

Mitabled Make Robert Gweet, Hon 140, Vernalbern, Moine

SAINT MARY'S HALL

b classocate. Accessited college prepared greens. " + L toto start theory. Her year, he we Margarat

Maximirana, M.A., Jian S., Fareingth, Milan,

SOUTHERN SEMINARY

the transfer of the second second the state of the s * I to the second the Durham Pres, Bux 10-1 M. Buana Vista, Ya

WALNUT HILL Introduction of the ати, априлась В₁ ре e . tra mp Nn n * ... to the same of the Menter II Day on, Propespect, Jill Mightons Strang, Markett, Manag.

SCHOOL trutter. There are suffered prepared that it is the start.

Mine La Missie Law 1 4 4 1 Mr. Belob derg. Prib. Bon M. Wedtuelbe, Ve.

CO-ED SCHOOLS

w was your distance by W. Carreer. Prophility, March

HOME STUDY

Kan tergarien through 9th grade. South schooling for your child whetever you live. No teaching excerisons routired Frances to other babonia, often with advanced standing. Daily fermits, butch to see the second of the plant of the property of the provided. Velocity of the way were seen so . See Year 25, M. T. 43 n. 310n. advanced atmosfey. Daily freundt, butch me vice. Staft fully fithin, field for Caraling.

CALVERT SCHOOL

IS THELOWY HOMO, MALTIMONE 10, MIL.

CAMPS

ADIRONDACK WOODCRAFT CAMPS TO TED began 1 To Describe the control of City on the city of

I se mail trees i show I seeker Ware, M. Abbatt, Day, Bot 237 W. Jayattavilla, N. Y.

ADMIRAL BILLARD ACADEMY

, % Hew Landon Conn.

ADMIRAL FARRAGUT MAVAL CAMP.

Novy continue, irallarum, de la Curtare, See burn mily, è meste. Chine-cr Registrer, San 17 Inche Plane M. 1. * * * N-194 Ballavon Mail, I

a engineer of metabon lake party testemb

a alan - 1 South Mileson was not then the

BROWN LEDGE MAIN PTO'R PAR ... headam a finest same ** Doctor thing for a happing alternation of agralf, distinct

Lebrester Jr. Cut., Bon Q. Langenter Mann

CATHOLIC CAMPS

had the second of the second Latered Min than labou, discrip druggel en er Her J. M. State Way of Late." Am 9 A.

Her J. M. State property, W.O., Oly.,

47 L. W. 142 St., N Y.C. 54, Ed. 6.0840.

te-111 Weinstein in Case pe Alberta Ma de Parcopit e bescaling demographics de facilité de la linguiste de evane marsa harol. All lare , wrater agreement the sacatalogic. 48 Lake Phone Way, Colour, Inch.

FENIMORE NEW COMPACE NAME OF THE Wro. 5 W Hen day, Personan School of Maren

AMAMUR. 340 CANT 20th St., N. V.C. GM & 1400.

HALF MOON

1.45 1 Acres Ur. Edward M. Sterry. 330 Correll due , Manuaranes E. M. Y.

LAKE GREELEY " " " " hit i that the treat themse Cart his

However, 403 Chartes Latte, Wynnesseed, 72. AKE PEMBINA CAMP 📜 1

The state of the s 1 1 4 7 1 5 4 4 1 4 80 cm. L. Morganatera, 4752 Victoria Are., No tront 6.

4 3 - 1 at 15 - 4 - 4

egalgang 17 Penenylvaria. 1 a - 51 OGONTZ " " TO TO T

debased. She typing top, and II of this best had a construction to the state of th Salterctural, Res 600, Ogunty School F Ø Pa.

CAMP PAGWA 2014 Temp of This per by Trapped wheel

PERRY-MANSFIELD CAMPS

the first of the second * | Think Ports 6 (2 , () 2 7 1 Mark bridg 216 E 76th St., M V. 33, P19 3829.

----Ma - p M . F M Hammouth Co. Orinors, Mass.

4 f - ve tracreations, some for book # 18 with . by no care training. Lon. 1 0 m. nigge droop fall, Jacker u Militarry Acard-BITTED THE DE THE STAN AS IN THE SECOND -1 1 1 1 4 1 4 4 m 1 () | () | () |

plant the first that the land the state of the first the state of the land the state of the stat

at & # N-154 Ballavon Haft, Boloffeld, Wite.

BOSTON UNIV. SARGENT

CAMP ON a private lake it. New Henry . The state of the s

ARROWHEAD Kelyster Bary new SUSQUEHANNA Berry British of Company and appropriate to a to a coll. Page 1881 he people to decision to the first terms of the forest at the constraint of the collection of the colle ter appearing. Final land from the second

VOCATIONAL



Dean DO Mar hornagh St. Goston 18 51 L Sugar no St. Chicago 11: 230 Park See. Nem York 37: 155 Arguil 51., Provisiones 4

Security State | It of the Party Assessment House Track | In 1917

TRI-STATE COLLEGE 1 1 1 4 5 1 1 1 1 1

1447 Cultings Ave. Anguar Indiana.

BOYS' SCHOOLS

ADMIRAL FARRAGUT

A resident property of the section o and I seems to be be a Ben L, Total Steen 10 J.

and the state of Lamping Share DEC B II A WELL AS AS AS A STREET OF THE PROPERTY OF

or selective to be suffered as a few the straped at each or beat R 19 T v. Leign. ota gamesa una congressional gip. At my are a later real part to the year of a reprise Antidress at communications in

Mapas Chut 3. Retter dr., See W Farl Delterre, Vo. and the motion manufactor are

On Sewariful St. John & Brown . 61 111 4 1 T - 1 · · · · · · f , i a p. 1 J c | D. Percide at Adm axions, por SQAT-M, day knowet he. Fra.



BORDENTOWN MILITARY

1 1 1 1 1 the property of the property o Bonnegene than 654 Barrier frem, biem Jarren.

Gam. Bobt. Les & illen. By La.R. St. Char. Boot of hear o

MILITARY Accredited I the transfer of the state of , 14 341 Col. M. M. de tention ing Proper Landahunt Tanner.

READ MARKS IN

4 1 1

Dapt 14, Culombia, Tana

on Lake Mattahanken 1 1 1 4 4 1 0 10 4

48 Pershing Was Dutter jad.

DARLINGTON SCHOOL FOR

N Wilcox Ph D , Cranidant, Came Ga.

15. the state of the state of the contract of the state of th

91 30 1 ...

the total Walter & Manualta. Produkting, Ban Ş. St. Pelaranjaig, Flarens

to the state of th State of the state of the state of Graude A. Britisch, St. Augustine, Fin-

201 201 4 i Brusrator, Pres , Catlege Park,

MILITARY SCHOOL ALSO STATISTICS CAMP 11 1 20 M was Nep some that Malayer has g.

HILL MILITARY ACADEMY'_, !

Wash by a fac

A CITY OF THE STATE OF THE STAT 4 - 4 - 5 - - - - - - 11 or Jun A. His Print, Bept MG Back, Butte, Pertland 19, Occ.

HOWE MILITARY SCHOOL

1 14 14 16 16 16 17 17 14 14 14 the second section of 1 1 10 0 1 1 Burrett II: Buston M.A. Sunt, 9-17 Acostony Pines Heine, buifannt.



KEMPER MILITANT HIGH SCHOOL ASSESSMENT OF STREET

1 1 4 5 5 by m 1

S. III A TH. A .- I Common A. M. Helich. 1047 Paul 50 Bearwille, Mercauri.

KENTUCKY MILITARY PEEKSKILL MILITARY INSTITUTE CONTINUES AND THE MACHINE MACHINERA IN MACHINE MACHINERA IN MA Cos C & B. B. comment From Bos N. Lyndon, Br. monter, Box 14. Popleshed on Hartson, D. T.

ACADEMY

Director of Admies and Box 447 Manhous & V

MASSANUTTEN MILITARY

MERCERSBURG ACADEMY

Charles and the first 1 1 1 1

It the first the first terms to the first term terms to the first term terms to the first W. B. Canroom, Itcher, Millard Con.,

MISSOURI MINETARY ACADEMY -1-1-2

Col. C. H. Straining Bar Man St. Marko, Mo.

MORGAN PARK ACADEMY 4.3.2.6

4 6.11 Gid C. C PRESSAR, SELL Bun P. Stangell M. M.

the state of the s

NORTHWESTERN MILITARY JND HAVAL ACADEMY The state of the s 54 Lake Share Rues, Lake Coness, W. a.

OHIO MILITARY INSTITUTE

1 1 0 12 KII H 111 14 o i . A. Cul. A. M. Hen uben Bor NG, Cobage H S Cincepage 24, Disc.

ONARGA MILITARY SCHOOL

Maria and the second second Co. L. W. Barringer . How W. Deargn. by

OXFORD ACADEMY . . Bon C 92. P vanament v N. J.

PEDDIE " TO THE PEDDIE W Lear E. Soundary, Headmenter Box 4 N, Hightstame N. 1

PEEKSKILL MILITARY

PENNA, MILITARY PREP

PERFARATION for all religion. Also ith grade, Small classes, Guidance program, H. O. T. C. Highest War Department rating Sports outro-C. H. Malf, Handmanter, Dopt. S. Chaster, Pa.

PERKIOMEN SCHOOL

linn Yanz. Days laught how to ctury. Thorough, redividualized codinection is usual change. Graden olf, Accoding, Straces compan. Physical fitness circumst Cambridge Affairt E. Regure, San 647, Presidenting, Fa. thear Admirant.

RANDOLPH-MACON MILITARY. Administration. ACADEMY TO Neyline Urive. Prepares for college through intensive study surthals. Please soil butted reports. Write for estador. Ond. John C. Bussan, Pron. San E. Front Revet, Va.

MILITARY ACADEMY

FIGURE ACCRETICATION propagation for all conjugate desirable residence desirable desirable residence desirable residence desirable residence desirable residence desirable desir might. Separate school for relegge buyer RITHRESTING ASSESSMENT the expense facilities of you exemple to block plants and the body to be to b WHEN PERSONS

BOYS AND PARCETS amuscinist the surfed articular and wall empirical program, the is a little dependence of the street of the Ministratural values of our revision

LATT & BLANCE IN and a contain MINTER IN PERMIT

Red 7

SENTEN SANSF DERFOR POR Horstein M. Larry Academy fron Joseph Germander Georgia

ROOSEVELT MILITARY ACAD-

EMY "BUILDERS of Men." Millery Staff of World War II Officers. Pully Accresited. Digh Behind: dr. School: Curretunding Continue Dept. Ages 16-16, All sports: Billing: Modernta cuts Catalogo Col. Glon C. Milithan, Box C. Alesta, Ill.

ST. JOHN'S MILITARY ACCURATE ACADEMY in Wisconsists land of laboration for the control of the c suilleg, Wieter spects, Figing, fluncture Sension, un'd 17. Coloing, 1347 Duffoyes Nall, Detailed, Wis.

SAINT LEO COLLEGE PREP

Acceptation Deposits sellege presignation Days in a second discount Separated state, Lind of Second Second Second Private has a port Med-era equipment Gray, Est. 1981 Near Target Cort-May, Nev, Father Raphael, Rex M. Salet Loo. Fla.

SAINT THOMAS MILITARY

ACADEMY MILITARY training combood Sills emperier consum properstion to Catalain environment. Individual guidance, Vory Sev. V. J. Flynn, Rox 2, 5q. Paul 1, Stinn.

SEWANEE MILITARY THOROCOURSON ACADEMY MOTOL Boats charge boys and a private mountain domain is an emergenced. green, Siports, Signi, pool, Montecute rate, with gr. Carning Gen. G. S. Allin, Bux M. Samapue, Tonn.

SHATTUCK SCHOOL MINNESON Exis. Founded ide. Brew college prep. Macticinstigut ratio les ROTC, Lisports, fall-mire entration, Pennel golf duorne, trapal-sot, integrate skitomer, Prod. Chair, Band. Summer-School-Large. Depald Honoing, D.D., Robber, 475 Shotmary.

Distinguished for excellent agademic military and athletic train-

lay, Highest Was Dept, Ration. la bierceic Shenandows Valley of Virginia, Pilgh alsitude, Usaxcelled health record, Was Dupt.

R.O.T.C. Unit. Separate Justice School. Early seroliment desirable. Catalog. Superintendent.

* Box D-1, Strandon, Virginia, TENNESSEE MILITARY PRESSURE

INSTITUTE has been added to be the second of the second of

TODD SCHOOL AND CAMP

Borre e to 20. I was par Armound to decide a College Propagation, Study July, Creative Activiment. Riding. Hour from Olicies. Cotalos. Sugar Hill, Prec., then Q. Woodshock, Olinois.





White to the per person of the person of the

Bane M. Wayman, Phy.

WENTWORTH MILITARY ACADEMY Separate Eye, College R. U.T. C. and U.A.A. Flying. All and the American Start of the Control of the Start of Control of Control

WESTERN MILITARY ACADEMY

Dioxip arresollted traduling prepares for any college. Grades it 12. Days taught how to street, Personal attention. ROTC. Highest gree's rulling. Sports. Blai-Big. Pool, gyrn. 10th yr. Near St. Laun. Carnina Col. W. L. Jackson, Pres., Box N.4, Alteo, Hr.

WILLISTON ACADEMY BRUNDS echiendlened reportunities for begand mediat and. Endowness over half a resilion. Geschiebes regularly accepted by all eastern colleges. Modern ary monators, a wroteling prof. Deparate Juntur School. A. V. Galberith, Hosdwatter, Soz 21, Earthumpton, Mass.

WORCESTER ACADEMY

LITTER'S TROUBLE Y Enough prop, select for large tiet 153. Sound structuration for college and her Lekay A. Campbell, Ph.D., Hundmister, PS Pravidence Street, Wernester 6, Mass.

*DUES+ Assembly armabership in United States, \$4.00; Canada, \$5.00; abroad, \$5.00. Life morebereling, \$100 U.S. funds. Resultances should be parable to National Legagraphic Society. Remittances from ontolde of vinctipental United States and Cannon thould be made by New York drids in international money order.

RECOMMENDATION FOR MEMBERSHIP

MILITARY

ACADEMY

IN THE

NATIONAL GEOGRAPHIC SOCIETY

* The Membership Dues, Which Are for the Calendar Year, Include Subscription to the National Geographic Magazine

Hame and Address of Nontingting Mamber

	y, National Geographic Society,
Streenth 4	and M Streets Northwest, Washington 5, D. C.:
nominate	
Occupation	
	The information is tenjoirteed for the records.
łddress	
	for membership in The Society.



I low can you best be sure that the monu-I I ment you buy is cal from the fibral granite, artistically correct and fully backed by a guarantee that means comething?

There is one sare way to identify a monaanent of superior quality, design and workmanship, and the dealer who sells it; look for the Barre Guild Seal (shown above) etched incompletionally in the monument itself and on deplay in your dealer's showroom, Monumeans bearing the approval of the Guild are made only of Select Barre Granite, are guaranteed by the Guild's Certificate of Quality the strongest guarantee in the monument industry.

YOURS FOR THE ASKING

Send today for new banklet, "Monagaret Iden" - a handpicted selection of impiring monument designs. David Guld, Deck NG 40, Barry, Vermont,

然。然。然,就一般一般,你就是什么

ENLARGED MAPS

Made available as a service to members by the National Geographic Society. Highly legible and printed in ten colors, they are ideal for wall display in Schools, Libraries, Offices, Hames.

BIBLE LANDS-64%"×44%" UNITED STATES-67" × 43%" THE WORLD-67" × 43%" NO. & SO. HEMISPHERES-67" x 3512"

ENLARGED MAPS On Heavy Chart Paper	How Many Copies Desired			
	Mapa \$2 parts to D. S. S. Phase . Elizables: \$2,25	Indexon 25 11 A.A. 1 and 6226 55.		
Bible Lands				
Chiros States				
The Westd	-			
No. & Sa. Rombipboren				
Contract their are mailed rolled to U. S. and Pinnessine. Protein regular these process have furting these names for machine is all other places.				



in Massachusetts

· · · You'll land at Plymouth with the gallant Pilgrim band . . . ride with Revere . . . stand staunchly with the Minutemen. In your ears will echo the ringing words that started a war at Lexington . . . the roar of Old Ironsides guns, the rattle of musketry and the shrill cry of painted warriors. If America's history thrills you . . . see it come alive in Massachusetts, where so much of it was lived!

Write for the booklet Vacation Variety." Address the Massachussette Development and Industrial Commission. Dept. A.1. 20 Somereel Street, Boston 8, Massischaselts.





We've added 80,00

telephone girls

in the last year

We're working hard to give you more and better telephone service than ever before.

In the last year, we have added 53,000 telephone operators; also 27,000 service representatives, secretaries, clerks, stenographers, typists and manufacturing employees.

These are just the figures for women. We have also increased our employees by 80,000 men-most of them was veterans.

Yet in spite of record figures on employment, manufacturing and installations, we are greatly concerned that there are still more than 2,000,000 people waiting for telephone service and many who are not getting the kind of service they want.

We want you to know that we are doing our level best to catch up with every telephone need of everybody-everywhere.

BELL TELEPHONE SYSTEM



ORIENT

the world's supreme travel experience

AMERICAN PRESIDENT LINES

Normal 'Round+the-D'orid service touches 14 countries and 25 ports of calls New York, Buston, Havana, Cristolesi, Balbon, Los Augeles, Sau-Francisco, Hanninia, Yokobama, Robe, Shanghal, Hong Kong, Manite. Singapore, Penasar, Colombo, Bombay. Suce, Port Said, Alemedria, Nuclea-General Marreiller, (New York).

offered travelers to the Orient and Round-the-World: roomy.

shipside apartments, air conditioning, grand food, entertain-

ment, swimming pools. American flug service in every respect.

Do that on your travel agent, or write or call on us at 654 Pifth Ave., New York 20; 99 State St., Boston 9; 714; Transportation Bidg. Washington & D. C.; Hanna Habbling, Classiand 11; I I d South Dearborn Et., Chicago 2 : 234. Henry Bidg., Scattle 1; 514 W. Sluth St., Los Amgeles 14; or \$11 California St. San Francisco & (Head Office).

For 76 years America's high with the Orient